

SOFTWARE SELECTION FOR A LINER SHIPPING COMPANY
USING FUZZY LOGIC DECISION MAKING

by

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USING FUZZY LOGIC DECISION MAKING

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ABSTRACT

SOFTWARE SELECTION FOR A LINER SHIPPING COMPANY USING FUZZY LOGIC DECISION MAKING

This thesis mainly focuses on selection of software for managing operations of EMES Shipping and Transportation Company by the evaluations of scripted scenarios, requests for information (RFI), and demonstrations from software companies.

EMES Shipping and Transportation Company, which is a member of Arkas Holding Group experiences difficulties and delays in reviewing, approving, controlling and reporting operations between Head Quarter and Agencies due to processes that were overburdened with manual tasks, e-mail based workflow, and lack of process information. It is a necessity to select software from the market by evaluating them in the terms of company requirements. This process is a critical issue for future growth and competitiveness of EMES.

Key operations and activities of the company are obtained from department managers and staff. Gathered information is converted to a generalized request for information for the evaluation of the companies and their standard software packages. Five major scripted scenarios are prepared to understand how the software packages handle the operations of software packages. A demo evaluation document prepared for scripted scenarios to evaluate demonstrations.

A fuzzy approach is designed to evaluate companies with RFI scores, development time, and purchase cost variables. Finally an evaluation table and fuzzy based comparison results are prepared to show most fitting product to company operations and requirements.

Keywords: IS Procurement, Software Selection, Request for Information (RFI), Scripted Scenario, Fuzzy Logic

ÖZET

BİR ARMATÖR FİRMA İÇİN BULANIK MANTIK KARAR VERME YÖNTEMİ İLE YAZILIM SEÇİMİ

Bu çalışma temel olarak EMES Denizcilik ve Nakliyat A.Ş.'nin operasyonlarını yönetmek için kullanılacağı yazılımın, bilgi talep dökümanı (RFI), iş senaryoları ve tanıtım değerlendirilmeleri ile seçiminin yapılması üzerine odaklanmaktadır.

Arkas Holding bünyesindeki şirketlerden birisi olan EMES Denizcilik ve Nakliyat A.Ş. acenteleri ve merkez ofisi arasındaki işlerin ilerleyişindeki manuel çalışma, e-posta ağırlıklı iletişim, işlemlerdeki bilgi eksikleri yüzünden takip, kontrol, onaylama ve raporlama zorlukları ve gecikmeleri yaşanmaktadır. Firmanın ihtiyaçlarına en uygun yazılımın doğru bir değerlendirme ile seçilmesi gerekmiştir. Bu konu firmanın büyümesi ve rekabeti açısından kritik bir konu olmuştur. Temel operasyonlar ve aktiviteler firmanın ilgili departman müdür ve sorumlularından elde edinilmiştir. Toplanan bilgiler şirketlerin standart yazılım paketlerinin değerlendirilmesi için genelleştirilmiş bilgi talep dökümanına çevrilmiştir.

Paketlerin operasyonel uygunluğunun detaylı tesbiti için yüksek öneme sahip beş adet sürecin anlatıldığı beş farklı senaryo oluşturulmuştur. Ayrıca satıcı firmaların tanıtımlarının değerlendirilebilmesi için sorular oluşturulmuştur. Satıcı firmaların bulanık mantık yöntemiyle değerlendirilmesinde RFI skorları, geliştirme süreleri ve satınalma maliyetleri kullanılmıştır.

Son olarak firmanın operasyonlarına ve ihtiyaçlarına en uygun ürünü gösteren bir değerlendirme tablosu ve bulanık mantık sonuçları hazırlanmıştır.

Anahtar Kelimeler: Bilgi Sistemi Satınalması, Yazılım Seçimi, Metne Dayalı Senaryo, Bilgi Talep Formu (RFI), Bulanık Mantık

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LIST OF ABBREVIATIONS

ARKU	Prefix of EMES containers
B/L	Bill of Lading
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CMC	Container Movement Control
EMES	East Mediterranean Express Service
ERP	Enterprise Resource Planning
IS	Information System
IT	Information Technology
TEU	Twenty-foot Equivalent Unit, 20-foot dry-cargo container
RFI	Request for Information
RFP	Request for Proposal
WMS	Warehouse Management System

1. INTRODUCTION

1.1. Reasons for New Information System Acquisition

Packaged information systems are configurable systems that integrate information and information-based processes within and across functional areas in an organization. Configuring these large generic software packages to the needs of specific organizations, industry sectors, and countries is necessary and requires large investments of money, time, and expertise (Davenport, 1998; Klaus *et al.*, 2000). Most of the large organizations worldwide have already adopted their system and small and medium-sized enterprises are increasingly following the suit (Klaus *et al.*, 2000; Kumar and Hillegersberg, 2000; Bernroider and Koch, 2001; Everdingen *et al.*, 2000).

Almost all software packages can be customized to the specific needs of a particular organization. This, however, is very expensive and may lead to problems such as the incompatibility of product patches and new versions with the customized information system software (Butler, 1999; Kremers and Dissel, 2000; Sumner, 2000; Light, 2001). Consequently, some organizations choose to adapt themselves to suit the software being acquired instead of customizing the software to suit the organization (Davenport, 1998). However, as some organizations do not want to modify themselves or furthermore, have critical needs that can not be met by standard functionality provided by the packaged systems, it is in these organizations' best interest to select the information systems software that best fits their needs with the least amount of customization so that both further maintenance problems and organizational misfits are avoided (Davison, 2002; Light, 2001; Soh *et al.*, 2000; Everdingen *et al.*, 2000).

The main aim of ERP, CAD/CAM and other software evaluations are to identify the best alternative for company requirements. Different company surveys may result differently, because key operations and functions or way of doing works may differ. In shipping software business there are only three companies dealing with containerized cargo operations. Their products are different because of their customers, and locations

they work. Most of the shipping lines have their software developed in-house. There is no research found for shipping line software evaluation.

EMES is a medium sized liner company that is in need of an information system for its effectiveness. Reasons for acquiring information system software for EMES can be categorized as technological and business. These reasons are given as:

Technological reasons:

In this category, the acquisition of information system is motivated by the need for new information technology, and mainly aims to support current way of doing business (Hecht, 1997). This category includes also the information technology (IT) investments mainly aimed for efficiency improvements that are, cost reductions (Fitzgerald, 1998).

- Desire to outsource software maintenance and development (Brown *et al.*, 2000; Butler, 1999; Klaus *et al.*, 2000; Scheer and Habermann, 2000).
- Need for adopting clean slate approach in order to achieve improved software system to deal with, for example, structural fragmentation or lack of documentation (Davenport, 1998; Holland and Light, 1999; Light, 2001; Sprott, 2000).
- Need for common technology platform and increased standardization in technologies used across the organization (Parr and Shanks, 2000; Ross and Vitale, 2000; Sumner, 2000).
- Desire to replace the aging IT architecture or technology with more modern one (Brown *et al.*, 2000; Kremers and Dissel, 2000).

Business reasons:

Sometimes the existing information technology may be an obstacle prohibiting necessary, strategically important change in the enterprise (Hecht, 1997). In these cases, new IT is acquired not simply to reduce costs but to facilitate change in the ways of doing business and thus, to improve effectiveness or to gain strategic advantage (Fitzgerald, 1998; Silk, 1990).

- Desire to move to a standardized IT and organizational blueprint to deal with merger/acquisition or globalization (Brown *et al.*, 2000; Davenport, 1998; Holland and Light, 1999; Klaus *et al.*, 2000; Ross and Vitale, 2000; Sumner, 2000).
- Desire to adopt best practice business models and new ways of doing business, and to conduct business process reengineering (Brown *et al.*, 2000; Davenport, 1998; Holland and Light, 1999; Klaus *et al.*, 2000; Parr and Shanks, 2000; Ross and Vitale, 2000; Sumner, 2000).
- Need for increased flexibility and agility in doing business (Brown *et al.*, 2000; Davenport, 1998; Holland and Light, 1999; Klaus *et al.*, 2000; Parr and Shanks, 2000; Ross and Vitale, 2000).
- Data visibility and integration aiding managerial decision making and operations (Brown *et al.*, 2000; Davenport, 1998; Klaus *et al.*, 2000; Kremers and Dissel, 2000; Parr and Shanks, 2000; Ross and Vitale, 2000; Sumner, 2000).
- Pressure from the value chain and need for electronic networking and collaboration with customers, suppliers and other business partners (Brown *et al.*, 2000; Hayman, 2000; Holland and Light, 1999; Klaus *et al.*, 2000; Kremers and Dissel, 2000; Kumar and Hillegersberg, 2000).

1.2. Definitions

1.2.1. Data Gathering

Selecting a system that does not meet the enterprise's critical processes' needs, will cause projects to fail or greatly exceed the cost and time estimates. The fatal-flaw approach should be used to identify key issues before initiating an application selection and also to identify the most appropriate application vendor.

Defining Fatal Flaws:

Most enterprises have critical processes that uniquely define the power that makes an organization successful. These critical processes should become "critical requirements" during a software selection process. If the software vendor fails to meet these requirements, they become "fatal flaws" that will adversely affect the implementation.

Common critical requirements may emerge in statutory or regulatory compliance, integration with other installed software products, and processes with partners or customers.

The primary goal of focusing on fatal flaws during software selection is to find the requirements that, if not met by the software vendor, will ultimately cause the implementation to fail. They can exist in any area of decision criteria.

Because fatal flaws may not be easy to spot, the software selection team should model the enterprise processes well enough to determine where they are. Finding fatal flaws may require the selection team to go deeper into enterprise-specific processes than normal, but avoiding the selection of inappropriate software could produce a significant cost gain (Y. Genovese, B. Zrimsek, 2004).

1.2.2. Traditional Approach

Traditional software selection projects rely on a long list of functional requirements (sometimes in the range of thousands) that identify the vendors with the best functional fit. In this approach, users create a list of requirements to which vendors respond, and the users then develop a vendor shortlist. The short listed vendors then perform scripted demonstrations, from which a finalist emerges.

In this type of analysis, there's typically no differentiation among functions — all are treated equally, which creates a challenge for users to uncover the requirements that are critical and that are commodity. Even if criteria weighting is used, the sheer number of requirements greatly waters down the impact of the most-critical criteria. In many cases, users become confused by the end of the selection process as to which vendor provided the best answers to their most-critical functional issues.

Application vendors continue to support the "rule of thumb" that a 75 percent to 80 percent fit between business requirements and available functionality is good enough. Although this may be true for some situations, if the 20 percent to 25 percent of missing functionality is critical and is required to run the business, selecting the wrong software

can undermine the entire IT strategy. One can significantly lower the risk of making the wrong software selection by modifying the normal selection process and focusing first on the few functional or technological issues that differentiate the business (Dan Miklovic, 2000; Karen Peterson, 2003).

1.2.3. Request for Information and Proposal (RFI/RFP)

Most enterprise applications are purchased after a process of investigation, piloting and comparison. The first step in the process is to take a look at RFI preparations. Business understanding is the most important issue in this respect. The knowledge about the operations and how they are performed can be learned from department staff. Process charts, responsibilities, data flow charts must be clarified and procedures must be stated well. Departmental operations should be listed and then converted to questions in order to identify the features of the candidate software. RFI shows the vendor, the fatal flaws of the company. While preparing an RFI, team members should focus on their businesses in detail (Scardino, 2001).

The RFP is the formal logical view of an organization's environment and vision for automating key business processes. The ideal RFP will solicit a response that can be converted virtually unchanged into a contractual agreement. An enterprise should try to provide enough detail and vision to limit the amount of clarification and negotiation that can occur. It should also specify, where practical, that responses to certain requirements will indeed become part of the final contract. The RFP should be organized in mandatory vs. optional requirements. It is the place to include standard and nonstandard corporate contracting boilerplates. (Casonato and Popkin, 1998)

RFP's and RFI's play an indispensable role in the IS procurement process, but the benefits of an effective RFP or RFI go far beyond price. An RFP can help an enterprise anticipate needs and resource requirements if it is done correctly. Though time-consuming, completing a detailed RFP also fosters a long-term business relationship with the selected vendor (L. Mieritz, C. Lusher, 1997).

In this study requests of information and requests for proposal are combined because there were only three vendor companies to evaluate.

1.2.4. Scripted Scenarios

Traditional software evaluation techniques are becoming increasingly inadequate for complex integrated systems. Enterprises can use a hybrid approach, called scripted scenarios, as an alternative method for vendor selection.

In most software evaluation projects, enterprises use two techniques to narrow down the field of contenders:

- Requests for information (RFIs) with detailed feature lists
- Software demonstrations

Although each technique has its merits, both have limitations. RFIs typically require considerable effort to develop, yet most vendors have their "matrix factories" respond routinely that they are capable of meeting more than 95 percent of the features listed. The small remainder of often obscure requirements can skew the selection process significantly. On the other hand, traditional product demos highlight what the vendor chooses to show, rather than what the client really needs to see. Furthermore, they usually involve generic data and process scenarios, making it difficult to ascertain the actual fit for the business (Mirchandani, 1996).

As an alternative approach for vendor selection, enterprises should use a hybrid approach called scripted scenarios.

A scripted scenario describes a unique problem that an enterprise wants resolved or a "best practice" - for example, customer collaborative planning or cross-docking - that it would like to be implemented. The description of the problem or planned practice is usually elaborate (several pages long). Ideally, it includes sample data that the vendor is instructed to use when creating a demo environment. Instead of a short two- to three-hour

product demo, vendors are expected to walk the project team through the scenarios as configured in their software during a period of several days (Karen Peterson, 2003).

Scripted scenarios give project teams a chance to articulate their vision for the business environment after the new software is implemented. The additional resource investment that such scripts demand usually pays off in the form of a quicker conference room pilot when the actual implementation starts. Scripted scenarios also give the vendor a better opportunity to understand the requirements of the enterprise, rather than just deliver standard software (Bell, 1999).

When Scripted Scenarios Work Best:

The project team attempts to truly envision the "future" environment (for example, the technology, processes, structure and culture expected) and describes it in the scenario. A typical Warehouse Management System (WMS) project pulls a warehouse from the technology and processes of the past — paper-based, little or no radio frequency (RF) technology and a warehouse staff that may have never used computers in the workplace — into those of the 21st century.

Scenarios have a broad focus, that is, they describe processes or broad functional areas, rather than specific transactions. In addition, only a handful of scripted scenarios (no more than 10) are developed for each application area (such as receiving, put away, picking, counting and shipping) being evaluated. This forces team to focus on broader functional requirements, rather than every screen and keystroke that is employed today. Furthermore, it enables vendors to demonstrate broader business processes, rather than functional threads that are hard to evaluate in the broader context of business requirements.

Most vendors will not make the extensive investment needed to respond to scenarios unless an enterprise is serious. Most vendors do not like the additional investment that scenarios require and will search for clues of the project team's commitment to the scenario format. (Miklovic, 2000) Enterprises should use the more-traditional request for information (RFI), with a greater emphasis on the other evaluation criteria (such as

technology, cost, service, vision and viability) and less emphasis on the unique functionality.

Scripted Scenarios: Necessary, but Not Sufficient

Although scripted scenarios can replace traditional vendor demos, some enterprises may still need detailed, feature-level responses to RFIs. In public sector enterprises, there may be legal reasons, and, in other enterprises, it could be a result of contracting guidelines.

In addition, scripted scenarios cannot replace site visits and other reference checks, nor can they replace performance benchmarks. In short, they are valuable tools, but not the only ones in the overall software evaluation arsenal (Miklovic, 2000).

Enterprises that use traditional techniques — detailed requests for proposal and standard vendor demos — are not customizing the evaluation process sufficiently to meet their unique needs (Malis, 1997).

Project teams that want their evaluation to reflect their unique requirements will design an appropriate number of scripted scenarios into their overall evaluation projects and use them to select the best functional fit. Vendor visits, site visits and reference calls should then be added to the total data available to select the best product/vendor for the project. Vendors that want to be successful will view scripted scenarios positively — as an opportunity to "factor in" unique client requirements (Peterson, 2003).

1.2.5. Demonstration

Vendors make demonstrations to show how good their products are. For purchasing large scale operational software, companies with nonstandard workflows should not only watch the vendor demonstrations. These demonstrations should be prepared according to the scenarios of the company. If company allows the supplier to run the demonstration as they wish, important issues may not be clarified. If the supplier presentation follows a concise demonstration script, evaluating the suppliers should prove relatively easy. The team will be able to review the supplied script and judge how well the supplier addressed

each key element of the script. At the end of each on-site demonstration, the individual team members will be able to review the supplier's handling of the demonstration script by answering a list of critical questions (Mirchandani, 1996).

1.2.6. Fuzzy Logic

In this study, fuzzy logic decision support system will be used to find the optimum software package. Every product will have an operational fitting value, development time and cost. So we will compare software packages according to these variables with the weights that EMES Company gives importance.

In the following you will find a literature review of Fuzzy Logic.

Introduction:

The term "fuzzy logic" emerged in the development of the theory of fuzzy sets by Lotfi Zadeh (Zadeh 1965). A fuzzy subset A of a (crisp) set X is characterized by assigning to each element x of X the degree of membership of x in A (e.g. X is a group of people, A the fuzzy set of old people in X). Now if X is a set of propositions then its elements may be assigned their degree of truth, which may be "absolutely true," "absolutely false" or some intermediate truth degree: a proposition may be truer than another proposition. This is obvious in the case of vague (imprecise) propositions like "this person is old" (beautiful, rich, etc.). In the analogy to various definitions of operations on fuzzy sets (intersection, union, complement, ...) one may ask how propositions can be combined by connectives (conjunction, disjunction, negation, ...) and if the truth degree of a composed proposition is determined by the truth degrees of its components, i.e. if the connectives have their corresponding truth functions (like truth tables of classical logic). Saying "yes" (which is the mainstream of fuzzy logic) one accepts the truth-functional approach; this makes fuzzy logic to something distinctly different from probability theory since the latter is not truth-functional (the probability of conjunction of two propositions is not determined by the probabilities of those propositions).

Professor Zadeh's paper on fuzzy sets introduced the concept of a class with unsharp boundaries and marked the beginning of a new direction by providing a basis for a

qualitative approach to the analysis of complex systems in which linguistic rather than numerical variables are employed to describe system behavior and performance. This approach centers on building better models of human reasoning and decision-making.

The basic principles are: 1. In fuzzy logic, exact reasoning is viewed as a limiting case of approximate reasoning. 2. In fuzzy logic everything is a matter of degree. 3. Any logical system can be fuzzified 4. In fuzzy logic, knowledge is interpreted as a collection of elastic or, equivalently, fuzzy constraint on a collection of variables 5. Inference is viewed as a process of propagation of elastic constraints. The basis of the theory lies in making the membership function lie over a range of real numbers from 0.0 to 1.0. The fuzzy set is characterized by (0.0, 0, and 1.0). Real world is vague and assigning rigid values to linguistic variables means that some of the meaning and semantic value is invariably lost. Fuzzy logic operates on a concept of membership such as the statement Jane is old can be translated as Jane is a member of the set of old people and can be written symbolically as $m(\text{OLD})$, where m is the membership function that can return a value between 0.0 and 1.0 depending on the degree of membership. In the Figure 1.1 the objective term 'tall' has been assigned fuzzy values. At 150 cms and below, the person does not belong to fuzzy class while for above 180, the person certainly belongs to category 'tall'. However, between 150 and 180 the degree of membership for the class 'tall' can be assigned from the curve varying linearly between 0 and 1. The fuzzy concept 'tall ness' can be extended into 'short', 'medium' and 'tall' as shown in Figure 1.2. This is different from the probability approach that gives the degree of probability of an occurrence of an event (Jane being old in this instance).

The fuzzy set theory attempts to follow more closely the vagueness that is inherent in most natural language and in decision-making processes. In a conventional logic approach, this inherent fuzziness of membership and categorization is not incorporated. Fuzzy logic has found many real-world applications that involve imitating or modeling human behavior for decision-making in the real world. Developments of intelligent systems incorporating the basics of fuzzy set theory have helped advance techniques for handling imprecision in soft computing. The primary idea in soft computing is to mimic human reasoning through building models of natural language variables, human interpretation and reasoning and it has found numerous applications in business and finance sectors, mobile robotics and also

in social and behavioral sciences. The dynamics and complexity of social systems are being explained and modeled through the use of fuzzy theory. In geography and environmental sciences, conventional cartographic representations for geographic phenomenon used definite boundaries for demarcation or differentiation in human and physical systems. Research in GIS and analysis of remotely sensed data has explored the use of fuzzy logic for representation of transition zones and imprecise categories. Again soft computing techniques have resulted in interesting developments in the field of geographic modeling, representation and analysis. The infinite-logic approach in fuzzy-set theory has also been one of the few attempts to respond to the "sorites paradox." The integration of fuzzy logic in relational database systems have also advanced conventional query techniques to incorporate linguistic variables and semantic concepts.

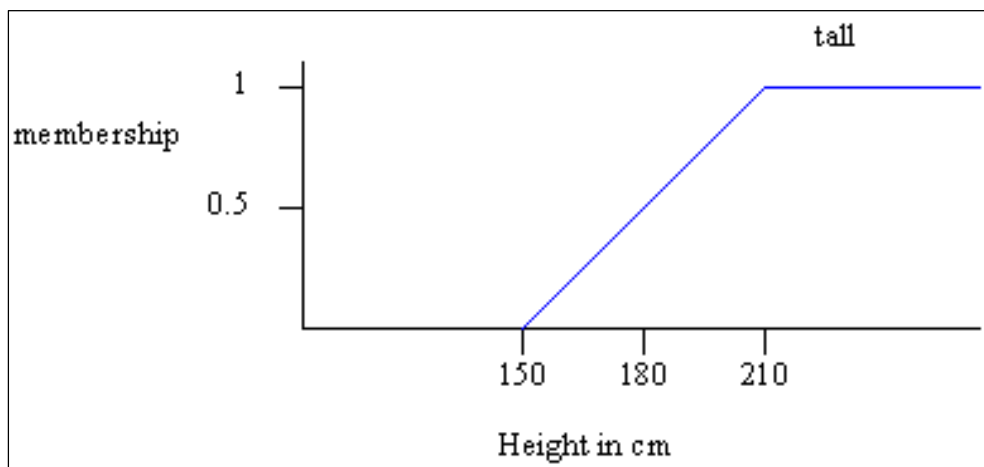


Figure 1.1. Graph showing membership functions for fuzzy set 'tall'

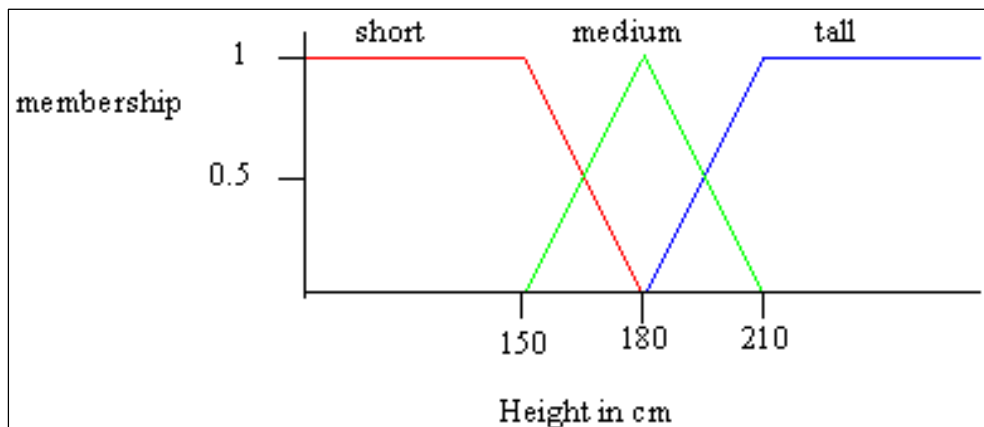


Figure 1.2. Graph showing membership functions for fuzzy sets 'short', 'medium', 'tall'

Operations on Fuzzy Sets:

We can introduce basic operations on fuzzy sets. Similar to the operations on crisp sets we also want to intersect, unify and negate fuzzy sets. In his very first paper about fuzzy sets [1], L. A. Zadeh suggested the minimum operator for the intersection and the maximum operator for the union of two fuzzy sets. It can be shown that these operators coincide with the crisp unification and intersection if we only consider the membership degrees 0 and 1. For example, if A is a fuzzy interval between 5 and 8 and B be a fuzzy number about 4 as shown in the Figure below;

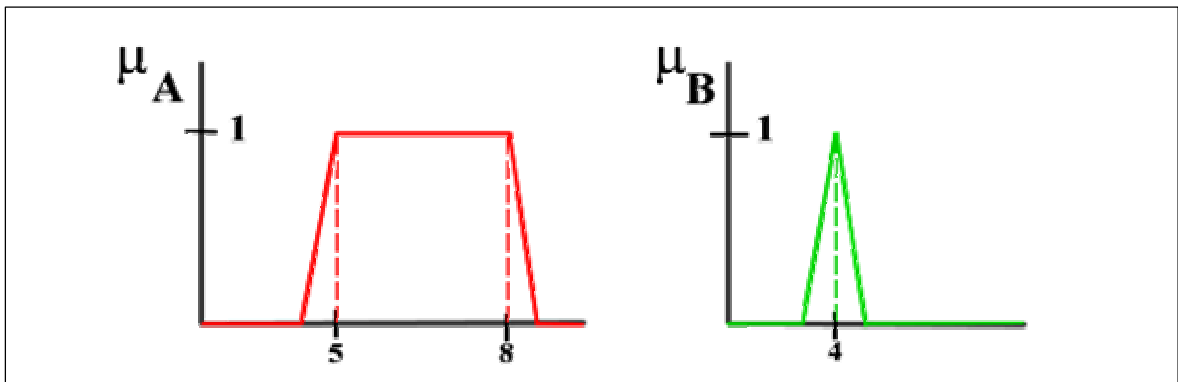


Figure 1.3. Example fuzzy sets

In this case, the fuzzy set between 5 and 8 AND about 4 is

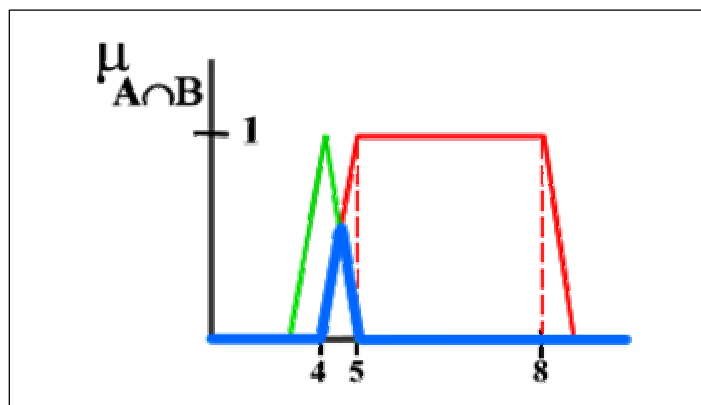


Figure 1.4. Fuzzy AND operator

Set between 5 and 8 OR about 4 is shown in the next figure

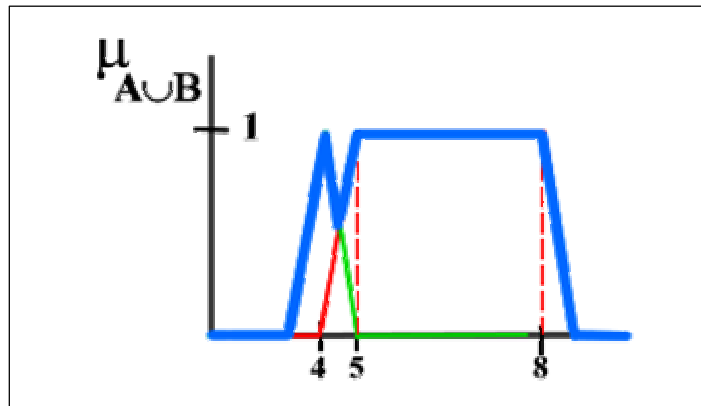


Figure 1.5. Fuzzy OR operator

The NEGATION of the fuzzy set A is shown below;

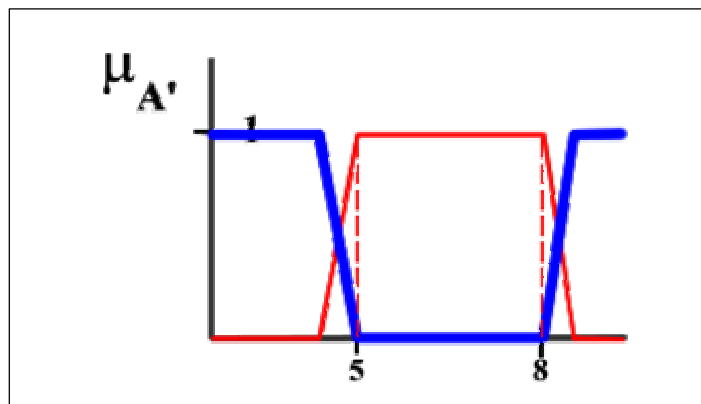


Figure 1.5. Fuzzy NEGATION operator

Fuzzy Classification:

Fuzzy classifiers are one application of fuzzy theory. Expert knowledge is used and can be expressed in a very natural way using linguistic variables, which are described by fuzzy sets. E.g., the polarimetric variables Entropy H and α -angle can be modeled as

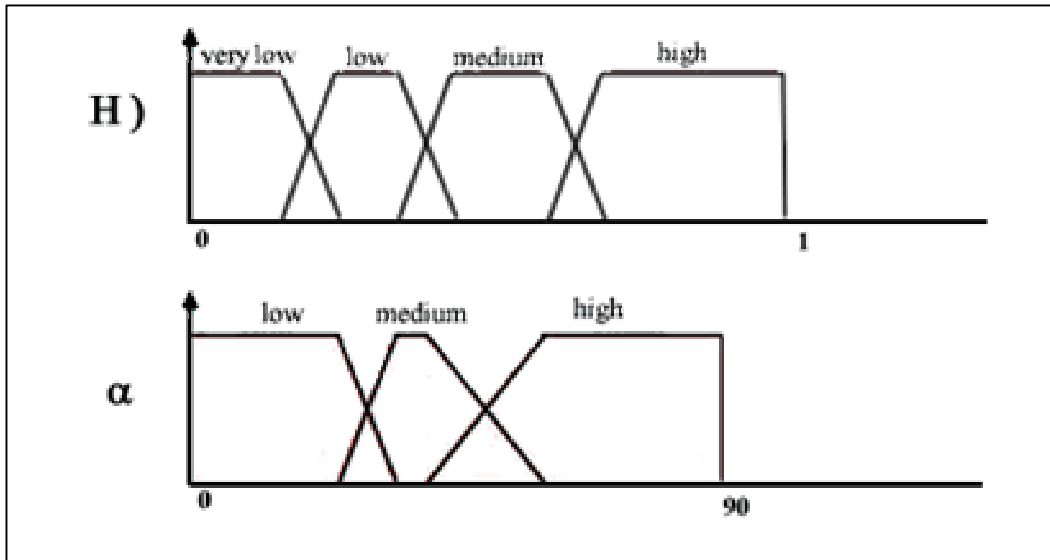


Figure 1.6. Linguistic Variables

Now the expert knowledge for this variables can be formulated as a rules like IF Entropy high AND a high THEN Class = class 4 The rules can be combined in a table calls rule base.

Table 1.1 Example of a fuzzy rule base

Entropy	a	Class
low very	low	class 1
low	medium	class 2
medium	high	class 3
high	high	class 4

Linguistic rules describing the control system consist of two parts; an antecedent block (between the IF and THEN) and a consequent block (following THEN). Depending on the system, it may not be necessary to evaluate every possible input combination, since some may rarely or never occur. By making this type of evaluation, usually done by an experienced operator, fewer rules can be evaluated, thus simplifying the processing logic and perhaps even improving the fuzzy logic system performance.

The inputs are combined logically using the AND operator to produce output response values for all expected inputs. The active conclusions are then combined into a logical sum for each membership function. A firing strength for each output membership

function is computed. All that remains is to combine these logical sums in a defuzzification process to produce the crisp output. E.g for a for the rule consequents for each class a so-called singleton or a min_max interference can be derived which is the characteristic function of the respective set . E.g. For the input pair of $H=0.35$ and $a=30^\circ$ the scheme below would apply.

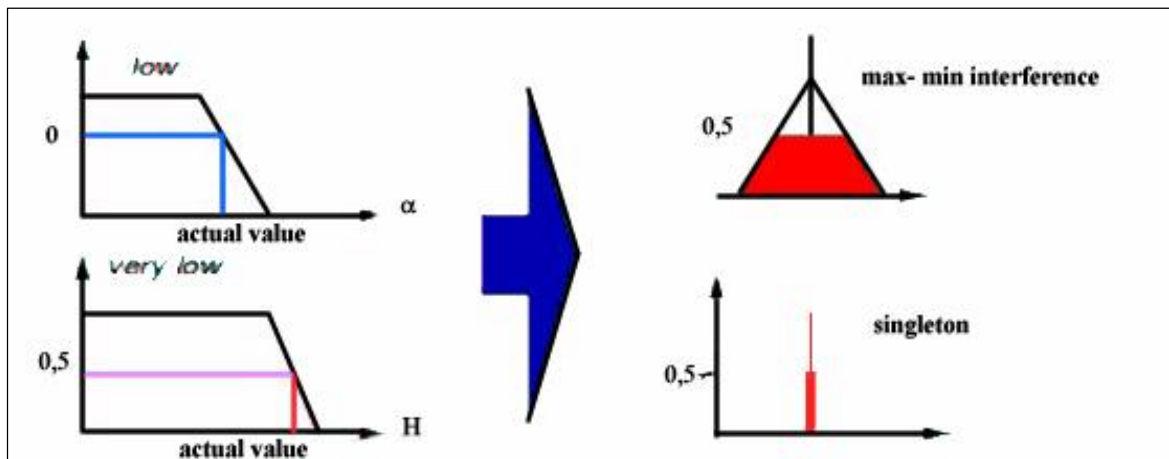


Figure 1.7. Interference for rule IF H very low AND a low THEN Class = class 1

The fuzzy outputs for all rules are finally aggregated to one fuzzy set. To obtain a crisp decision from this fuzzy output; we have to defuzzify the fuzzy set, or the set of singletons. Therefore, we have to choose one representative value as the final output. There are several heuristic methods (defuzzification methods), one of them is e.g. to take the center of gravity of the fuzzy set as shown in figure 7., which is widely used for fuzzy sets. For the discrete case with singletons usually the maximum_ method is used where the point with the maximum singleton is chosen.

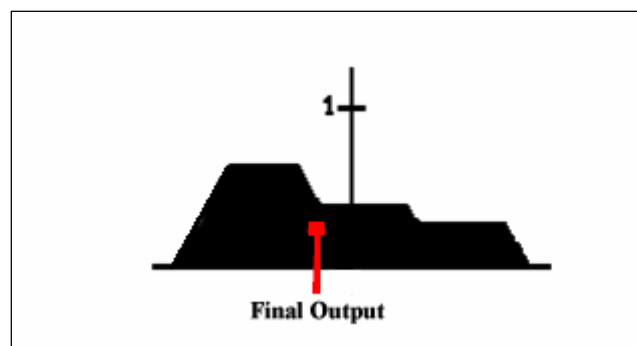


Figure 1.8. Defuzzification using the center of gravity approach

1.3. Problem Statement

EMES Shipping and Transportation Company, which is in Arkas Holding Group, is experiencing difficulties and delays in reviewing, approving, controlling and reporting operations between Head Quarter and Agencies due to processes that were overburdened with manual tasks, e-mail based workflow, and lack of process information. There is a need for about 100 people to use the system from different locations and authorities.

Software selection is a critical issue for future growth and competitiveness in business. 50% of packaged application projects fail because evaluation criteria are misunderstood or incomplete (Gartner Group, 1997).

There are three major vendor companies in Shipping Software business. The products of the companies have lots of differences in details, and workflows. Therefore evaluation criteria have to be performed.

1.3.1. Company Profile

East Mediterranean Express Service (EMES) Shipping and Transport S.A. was established within Arkas as a distinct, autonomous entity in order to accomplish the first Turkish-flagged container transportation in Turkey. Company's philosophy is to provide the best service with a workforce that is expert in their field.

EMES was founded in July 1996. Even though it is one of the youngest companies in the Arkas group, it provides services with 18 of its own ships and with 62 years of experience in transportation.

EMES' operations fall into two categories: feeder transportation and liner transportation with its own containers. Feeder transportation consists of transporting cargoes to, and unloading them from, large tonnage vessels which can not call at Turkish ports, and takes place between specific Aegean and Black Sea ports and the ports of Malta, Gioia Tauro and Taranto. This service, which uses Turkish flagged ships, facilitates

reliable container transportation movements between Turkish ports without infringing cabotage limitations.

Table 1.2. Services that EMES provides with own ships

Services that EMES provides with its own ships	
A) AEGEAN Service C	Gioia Tauro, Cagliari, Gemlik, Marport, Haydarpaşa, İzmir
B) AEGEAN Service D	Gioia Tauro, Thessalonikki
C) AEGEAN Service G	Gioia Tauro, Piraeus
D) EGYPT Service	Port Said, Haydarpaşa, Marport, İzmir, Damietta, Alexandria
E) NORTH AFRICA Service	Marport, İzmir, Algeria, Tunus
F) AEGEAN - SPAIN Service	Piraeus, Thessalonikki, Marport, İzmir, Barcelona, Valencia
G) BLACK SEA Service Shuttle	Marport, İzmir, Ilyichevsk, Odessa, Constanta
H) NOVO - CONSTANTA Service	Marport, Novorossiysk, Constanta
I) MALTA - THESSALONIKI Service	Malta, Thessalonikki
J) MALTA - AEGEAN Service	Malta, Piraeus, Haydarpaşa, Mardas, Gemlik, İzmir

EMES began operations with feeder services and began to provide services as a liner in order to meet export and import demand with a container park of over 10,000 TEU, including special equipment such as "open tops" and "high cubes", in line with the needs created by a developing and growing market. It was on this platform that EMES successfully made a name for itself.¹

Here is written departments of EMES Company.

¹ Information written here taken from www.emes.com.tr

CMC (Container movement Control) Department

This department controls the containers over the world, deals with daily movements, warehouse costs, demurrage incomes, empty container repositioning.

Operations Department

This department controls vessel operations, prepares schedule of voyages, loading discharging list from bookings, and makes bunkering.

Trade Department

This department is related with customers, prepares tariffs for lines, and gives discounts and free times to customers through agents.

Line Management Department

This department makes agreements with other lines for services and feeder transportations, prepares budget and profitability statements of voyages and decides services to operate.

Foreign Accounts Department

This department is related with accounting, agency disbursement accounts, invoicing, cost controlling, and payments.

1.3.2. Current Information System

Mainly, AS 400 system is used on both EMES and agents sides. Some patch programs are prepared to solve the problems like special freight rate approval or free time extension for ports but these were not effective because of AS 400 database. 80 percent of works are done manually. Agents send fax or e-mail to inform the head office about operations they make. Head office users enter all data to current system as much as

possible. There occur delays and errors in stored data. There are a lot of paperwork and double entry to different software. Reports are prepared manually after a time consuming effort. Variety and correctness of the reports are very poor. Controlling agent operations are sometimes impossible. Company profitability calculations, line management, container control, ship husbandry, disbursement accounting can not be made efficiently with the current system.

1.3.3. Desired Information System

A program that supports operations between EMES Head Quarter-Agents and Agents-Customers is desired. Agents will contribute to the system through Internet. They will connect to main server and perform authorized operations. The data will be entered only once. Container movements can be monitored on a daily basis. Line profitability, costs and revenues per voyage, per container and per port can be calculated. Disbursement accounting between agents and EMES should be established. Customer relationship management must be supported. Several types of reports should be generated.

Goals of the new system;

- Time saving
- Real time information and estimates providing
- Cost reduction
- Paperwork reduction
- Fewer transactions and fewer errors
- Automated processes
- Control on agents, equipments and vessels
- Managing disbursement accounting
- Allowing managers to concentrate on strategic tasks and future of business
- Documentation

2. METHODOLOGY

2.1. Business Units and IT Team

There were two teams for the IS project. One team is from Information Technology Department of Arkas Holding. Other team (EMES IT Team) is built for supporting information system from all departments. Teams met everyday until the preparation of RFI, scenario and scenario evaluation papers. These meetings proved that communications of departments were very poor. It was possible to make people understand other departments' processes with these meetings. Every single person prepared a requirements list for their own department. IT team combined these requirements and prepared an RFI to distribute shipping software vendors.

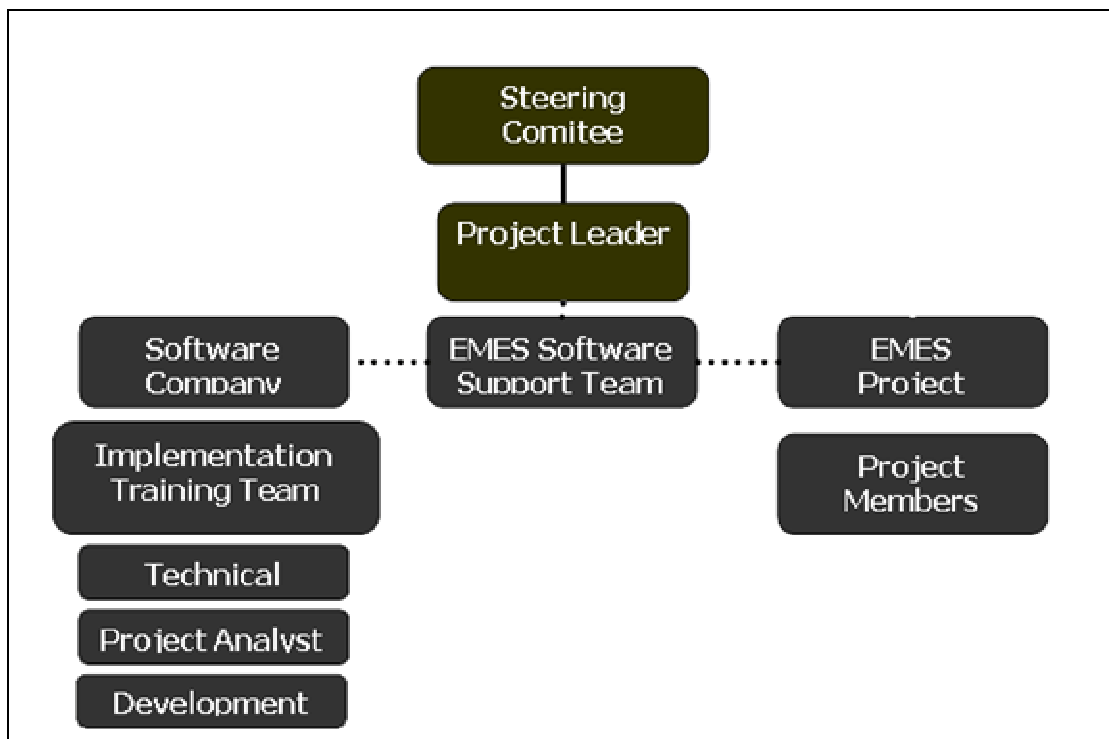


Figure 2.1. Project Organization Chart

2.2. Initial RFI

The Initial Request for Information is composed of; (See Appendix 7.1 for detail)

- Vessel Operations
- Quotations and Tariffs
- Bookings
- Documentation Module - Inward
- Documentation - Outward
- Documentation - Transshipment
- Switch Bill of Lading
- Billing
- Container Tracking
- Sales and Marketing
- Trade Module
- Agency Disbursement
- Yield Management
- EDI (Electronic Data Interchange)
- Hazardous Cargo
- Invoicing and Costing

2.3. Scenarios

Scenarios are prepared with the help of EMES IT Team for 5 critical processes. (See Appendix 7.2) These scripted scenarios are prepared for Container Movement Control Department, Line Management Department, Operations Department, Trade Department and Foreign Accounts Department.

2.4. Scenario Demonstrations RFI

A second RFI is prepared to evaluate vendor demonstrations of scripted scenarios. (See Appendix 7.3) This RFI is prepared with the aid of EMES IT Team. In this phase

questions were more detailed and answer classifications are prepared differently to evaluate the degree of accomplishment. Questions are classified into two sections; one is the functional requirements, and the other is the report needs.

2.5. Software Evaluations

2.5.1. Scoring of RFI

The scoring of RFI is performed by question and answer weights which are defined as:

Question weights²;

Essential: 10 - Desirable: 8 - Nice to have: 5

Answer weights³ are given below;

Table 2.1. RFI Answer Weights and Meanings

Weight	Answer	Meaning
10	YF	YF means "Yes, the current production release does this function in Full compliance of what is being asked for. YF = Yes, Full compliance.
5	YI	YI means "Yes, the current production release does this function, with the assistance of an Interface or another module. This does NOT include report writers! Put the name of the interface or module or system in the Future/Other column when indicating YI. Note: YI is -not- valid on Report questions, use NRW. YI = Yes, accomplished by Interface or another module.
0	NP	NP means "No, the current product release does -not- do this function. The next planned release will do this function in full compliance AND will be made available to customer at no cost (Since it is part of the "planned" next release).

² These weights are defined at Emes Staff meetings.

³ These weights are defined at Information Technology team meetings.

		NP = No, Planned for "next" release at no cost.
0	NRW	NRW means "No, the current product release does -not- do this report A business analyst may create and build. a report via a report writer to do this function in full compliance, as -all- required data resides in database tables and no fields are missing from our database. Note: NRW response is valid only on Report questions. NRW = No, Report Writer can generate this in full.
0	NX	NX means "No, the current production release does -not- do this function and functionality is not desired to be in our software product at this time. Nx = No, Not a desired function for software product. N1 through N100 means "No, the current production release does -not- do this function. An enhancement to add this functionality would take 1 to 100 days. Please Round up, when estimating number of days. N1 = No, but would take up to 1 day of enhancements. N3 = No, but would take up to 3 days of enhancements N10 = No, but would take up to 10 days of enhancements..

At the end question weights are multiplied by answer weights to form the total score.

2.5.2. Scoring of Scenario Demonstrations RFI

As mentioned before, Scenario Demonstrations RFI consist of two sections; functional and report needs. The calculations are different for these sections. Question weights of every functional item is 10 and every report need is 5. And also answer weights are different as written below. The weights are determined at staff and IT meetings.

Question weight of F (Functional) = 10

Answer Weights for Functionalities

- Not Available: 0
- Modification Needed: 3
- Customization Needed: 8

- Available: 10
Question weight of R (Report) =5
Answer Weights for Reports

- Not Available: 0
- Modification Needed: 1
- Customization Needed: 4
- Available: 5

At the end question weights are multiplied by answer weights to form the total score.

2.5.3. Fuzzy Evaluation

A decision making fuzzy approach is used to find best solution. Three variables are used; total RFI scores, development time, purchase cost. Development times are obtained from RFI's. Purchase costs are resented relatively for 100 user licenses.

Table 2.2. Inputs for Fuzzy Engine

	FWL Tech.	Tradeship	Softship
Total RFI Scores	6209	5996	5763
Development Time	235	79	234
Purchase Cost	33,5	33,9	32,5

Matlab is used for evaluations. Below graphics are generated by Matlab Fuzzy Toolbox.

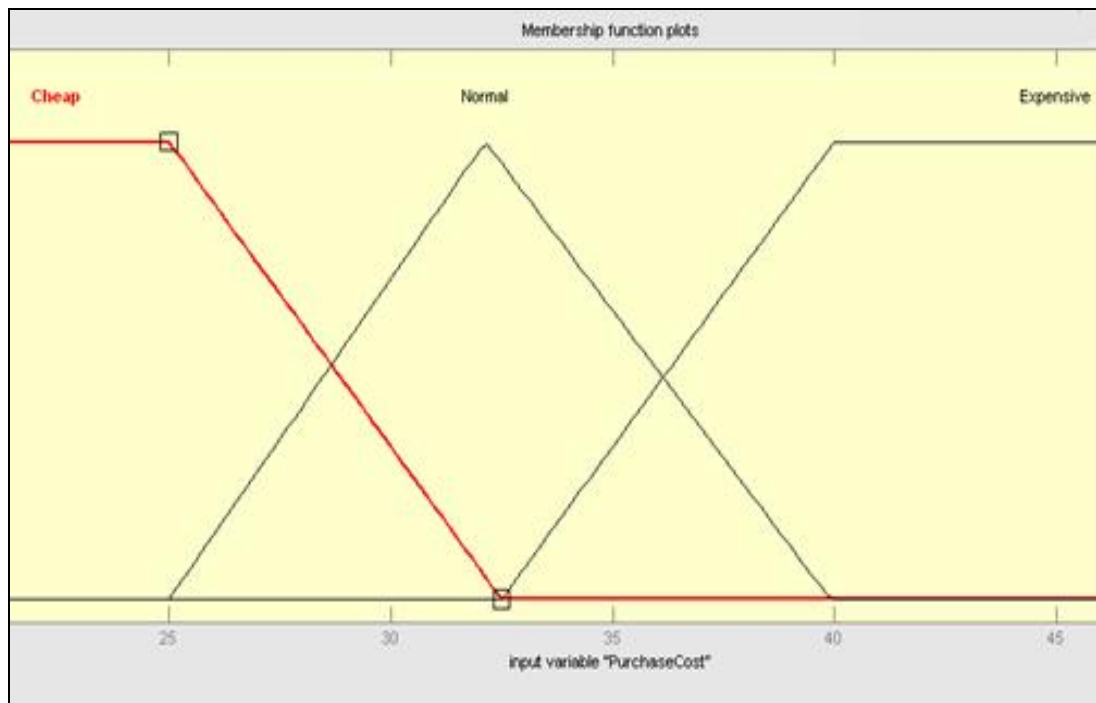


Figure 2.2. Membership function for "Purchase Cost"

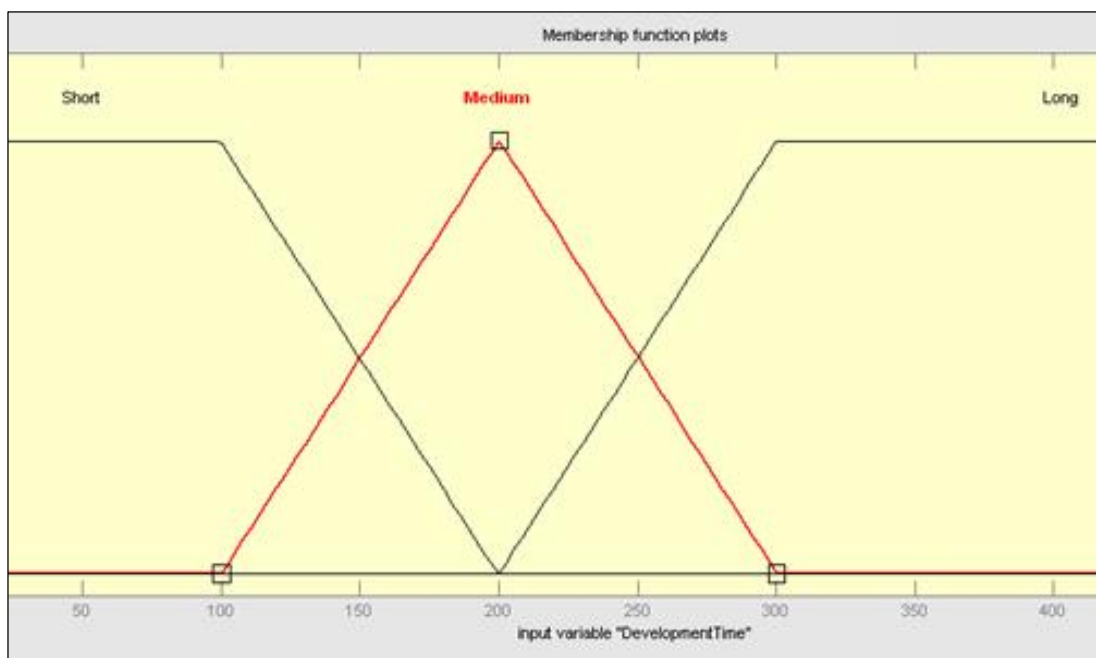


Figure 2.3. Membership function for "Development Time"

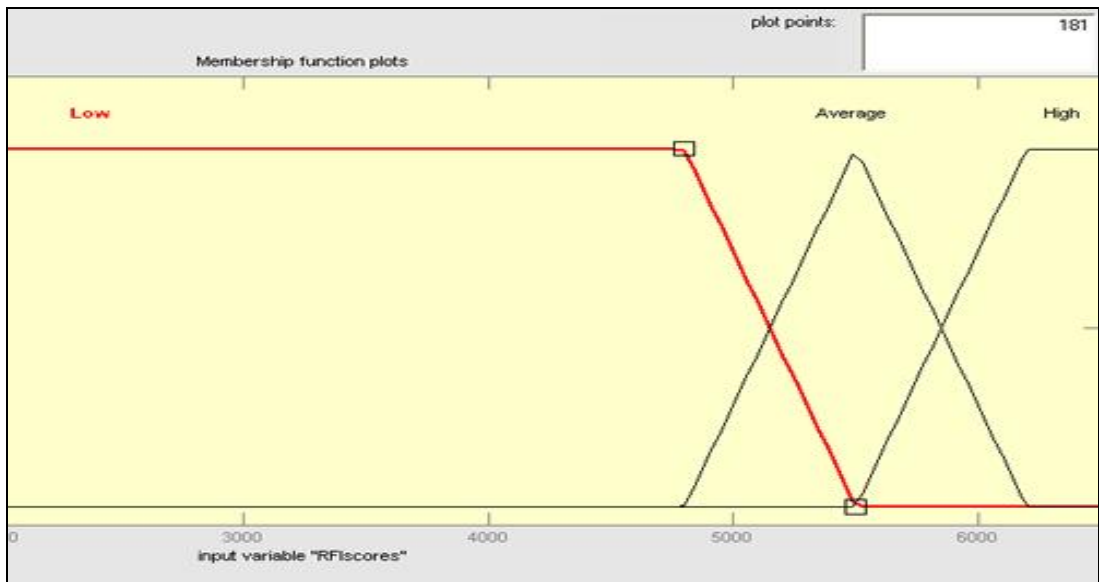


Figure 2.4. Membership function for “RFI Scores”

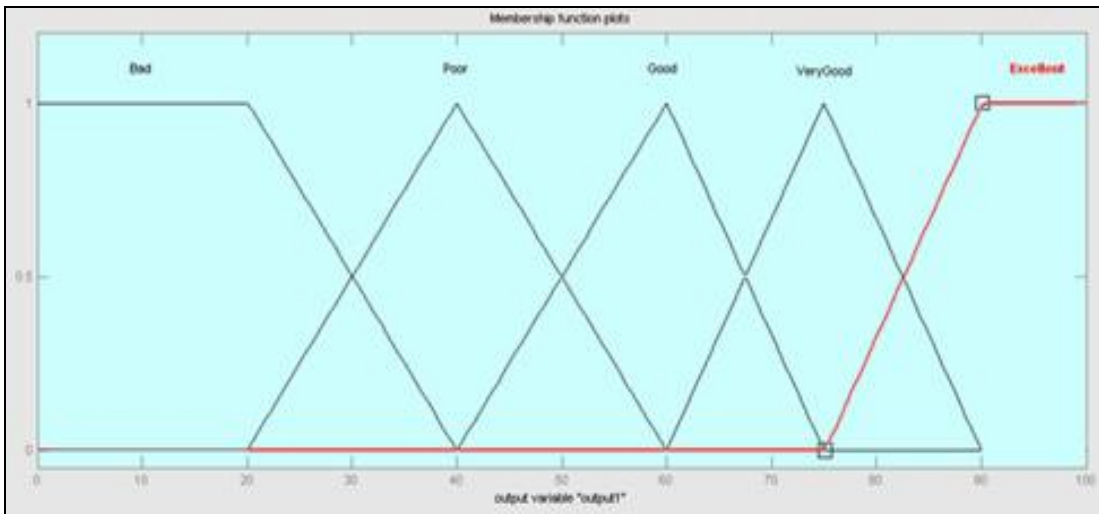


Figure 2.5. Membership function for “Output”

```

If (RFIscores is High) and (DevelopmentTime is Short) and (PurchaseCost is not Expensive) then (output1 is Excellent) (1)
If (RFIscores is High) and (DevelopmentTime is Medium) then (output1 is Excellent) (0.4)
If (RFIscores is Average) and (DevelopmentTime is Short) then (output1 is VeryGood) (0.5)
If (RFIscores is High) and (DevelopmentTime is Medium) then (output1 is Good) (0.8)
If (RFIscores is Average) and (DevelopmentTime is Short) and (PurchaseCost is Expensive) then (output1 is Good) (0.3)
If (RFIscores is Average) and (DevelopmentTime is Short) and (PurchaseCost is Cheap) then (output1 is Excellent) (0.2)
If (RFIscores is High) and (DevelopmentTime is Medium) and (PurchaseCost is Expensive) then (output1 is Good) (0.3)
If (RFIscores is High) and (DevelopmentTime is Medium) and (PurchaseCost is Normal) then (output1 is Good) (0.4)
If (RFIscores is High) and (DevelopmentTime is Medium) and (PurchaseCost is Cheap) then (output1 is Good) (0.6)
If (RFIscores is Average) and (DevelopmentTime is Medium) and (PurchaseCost is Cheap) then (output1 is Good) (0.8)
If (RFIscores is Average) and (DevelopmentTime is Medium) and (PurchaseCost is Normal) then (output1 is Good) (0.6)
If (RFIscores is Average) and (DevelopmentTime is Medium) and (PurchaseCost is Expensive) then (output1 is Poor) (0.8)
If (RFIscores is Low) and (DevelopmentTime is Short) and (PurchaseCost is Cheap) then (output1 is VeryGood) (0.8)
If (RFIscores is Low) and (DevelopmentTime is Short) and (PurchaseCost is Normal) then (output1 is Good) (0.7)
If (RFIscores is Low) and (DevelopmentTime is Short) and (PurchaseCost is Expensive) then (output1 is Poor) (0.2)
If (RFIscores is Average) and (DevelopmentTime is Long) and (PurchaseCost is Cheap) then (output1 is Good) (0.3)
If (RFIscores is Average) and (DevelopmentTime is Long) and (PurchaseCost is Normal) then (output1 is Poor) (0.7)
If (RFIscores is Average) and (DevelopmentTime is Long) and (PurchaseCost is Expensive) then (output1 is Bad) (0.9)
If (RFIscores is Low) and (DevelopmentTime is Long) and (PurchaseCost is Expensive) then (output1 is Bad) (1)
If (RFIscores is Low) and (DevelopmentTime is Long) and (PurchaseCost is Normal) then (output1 is Bad) (0.7)
If (RFIscores is Low) and (DevelopmentTime is Long) and (PurchaseCost is Cheap) then (output1 is Bad) (0.4)
If (DevelopmentTime is Long) and (PurchaseCost is Expensive) then (output1 is Bad) (0.9)
If (DevelopmentTime is Medium) and (PurchaseCost is Expensive) then (output1 is Poor) (0.5)
If (DevelopmentTime is Short) and (PurchaseCost is Expensive) then (output1 is Good) (0.2)
If (DevelopmentTime is Long) and (PurchaseCost is Cheap) then (output1 is Good) (0.2)
If (DevelopmentTime is Long) and (PurchaseCost is Normal) then (output1 is Poor) (0.9)
If (DevelopmentTime is Short) and (PurchaseCost is Normal) then (output1 is Good) (0.8)
If (DevelopmentTime is Short) and (PurchaseCost is Cheap) then (output1 is VeryGood) (0.8)
If (RFIscores is High) and (DevelopmentTime is Medium) then (output1 is VeryGood) (0.3)
If (RFIscores is Low) and (DevelopmentTime is Long) then (output1 is Bad) (0.8)
If (RFIscores is Low) and (DevelopmentTime is Medium) then (output1 is Poor) (0.9)
If (RFIscores is Average) and (DevelopmentTime is Long) then (output1 is Bad) (0.4)
If (PurchaseCost is Expensive) then (output1 is Poor) (0.6)
If (PurchaseCost is Normal) then (output1 is Good) (0.1)
If (PurchaseCost is Cheap) then (output1 is VeryGood) (0.6)
If (DevelopmentTime is Long) then (output1 is Bad) (0.7)
If (DevelopmentTime is Medium) then (output1 is Good) (0.7)
If (DevelopmentTime is Short) then (output1 is Excellent) (0.2)
If (RFIscores is High) then (output1 is Excellent) (0.8)
If (RFIscores is Average) then (output1 is Good) (0.6)
If (RFIscores is Low) then (output1 is Poor) (0.8)
If (RFIscores is High) and (DevelopmentTime is Medium) and (PurchaseCost is not Normal) then (output1 is Poor) (0.8)

```

Figure 2.6. Fuzzy Rules

These rules are prepared by IT Specialists according to the company needs, project duration constraints and the project budget.

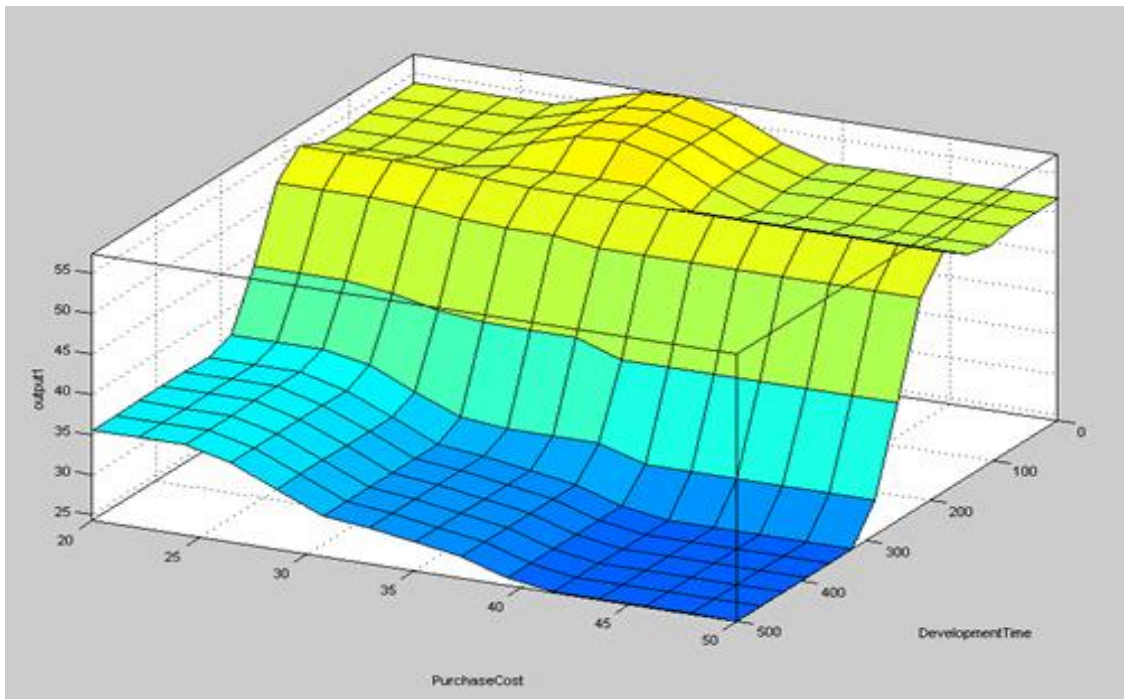


Figure 2.7. Surface for “Purchase Cost” and “Development Time” Variables

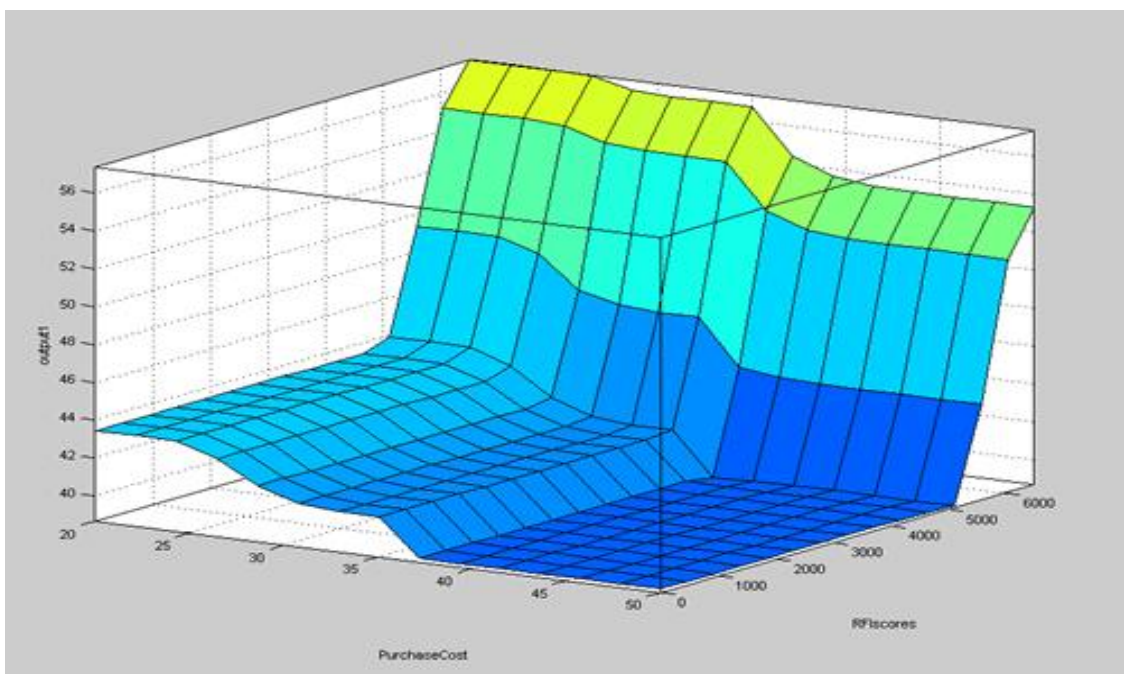


Figure 2.8. Surface for “Purchase Cost” and “RFI Scores” Variables

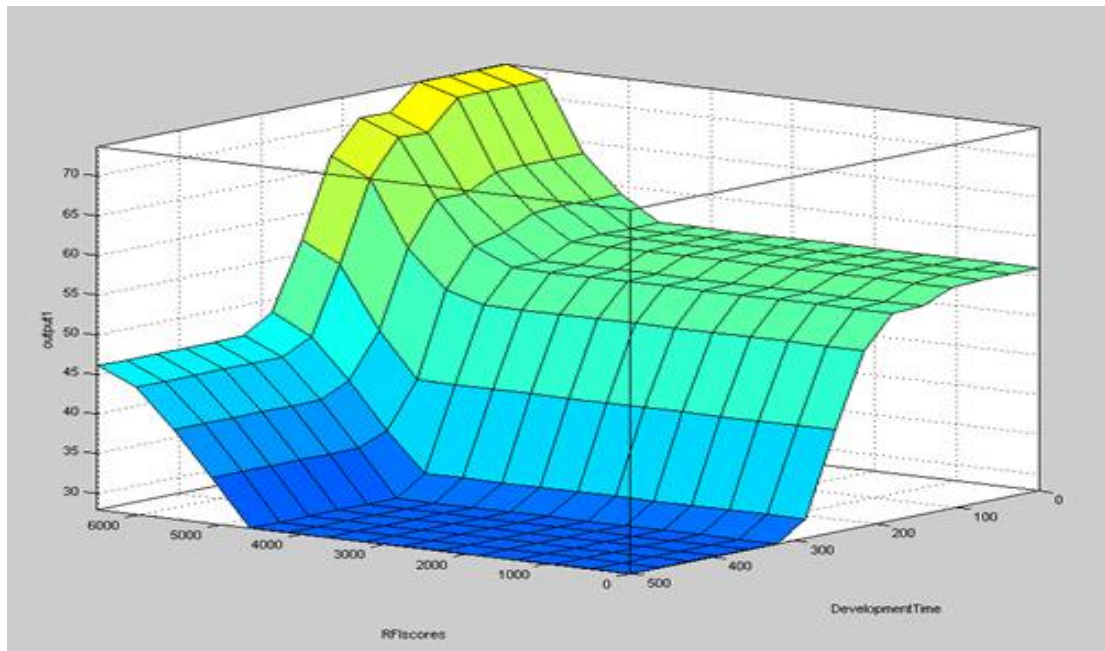


Figure 2.9. Surface for “RFI Scores” and “Development Time” Variables

3. RESULTS

3.1. Initial RFI Technical Evaluation Results

Table 3.1. Initial RFI Technical Evaluation Results

	FWL TECH.		TRADESHIP		SOFTSHIP		Max Points
	%	Pnts	%	Pnts	%	Pnts	
Vessel Operations	98	461	89	420	86	406	471
Quotations and Tariffs	95	180	95	180	84	160	190
Bookings	94	554	91	536	86	509	592
Documentation Module - Inward	85	410	89	425	87	418	478
Documentation - Outward	93	391	90	380	92	388	424
Documentation - Transshipment	80	186	80	187	84	197	235
Switch Bill of Lading	85	294	84	290	83	289	347
Billing	85	660	81	630	85	665	780
Container Tracking	85	815	84	810	54	520	960
Sales and Marketing	100	300	87	260	82	245	300
Trade Module	92	274	81	240	69	205	298
Agency Disbursement	61	135	89	195	70	155	220
Yield Management	100	50	70	35	60	30	50
EDI	100	64	94	60	96	61,5	64
Hazardous Cargo	100	206	78	161,00	87	181	206
Invoicing and Costing	100	174	86	149	68	118,5	174
TOTAL	89	5154	86	4958	78	4548	5789

3.2. Demonstration RFI Evaluation Results

Table 3.2. Demonstration RFI Evaluation Results

	FWL TECH.		TRADESHIP		SOFTSHIP		Max Points
	%	Pnts	%	Pnts	%	Pnts	
CMC	90	457	88	450	91	464	510
TRADE	89	129	90	131	90	131	145
OPERATIONS	94	146	85	132	82	127	155
LINE MANAGEMENT	61	88	76	110	62	90	145
DISBURSEMENT ACCOUNTS	90	235	83	215	81	210	260
TOTAL	87	1055	85	1038	84	1022	1215

3.3. Fuzzy Evaluation Results

Table 3.2. Fuzzy Evaluation Results

	FWL Tech.	Tradeship	Softship
Total RFI Scores	6209	5996	5763
Development Time	235	79	234
Purchase Cost	33,5	33,9	32,5
Fuzzy Results	62	75.8	54.1

Fuzzy rules applied to these values, and results are written below:

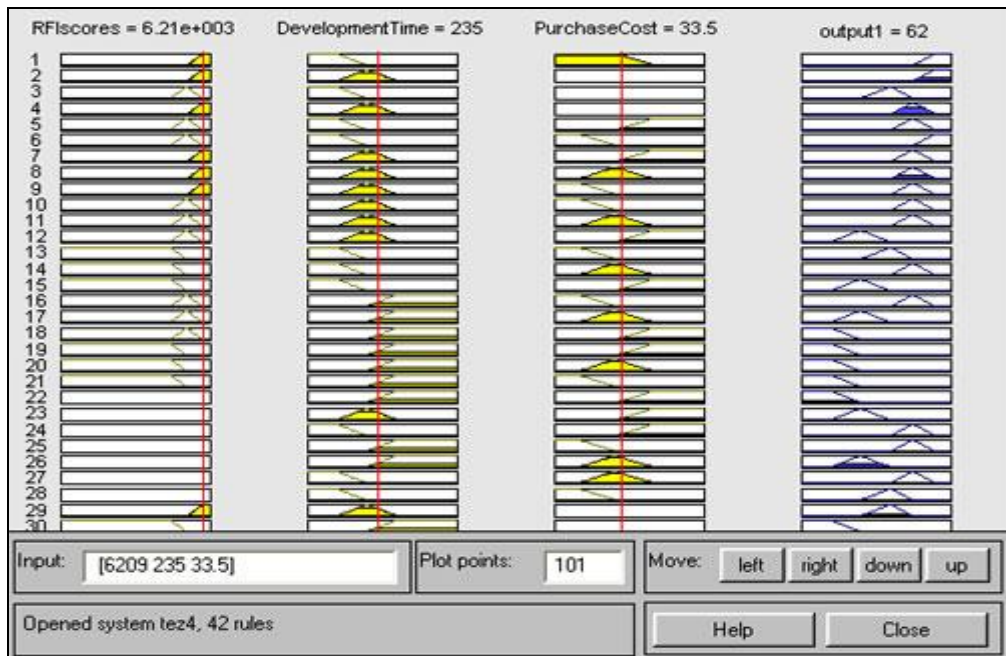


Figure 3.1. FWL Tech Score from Fuzzy Engine

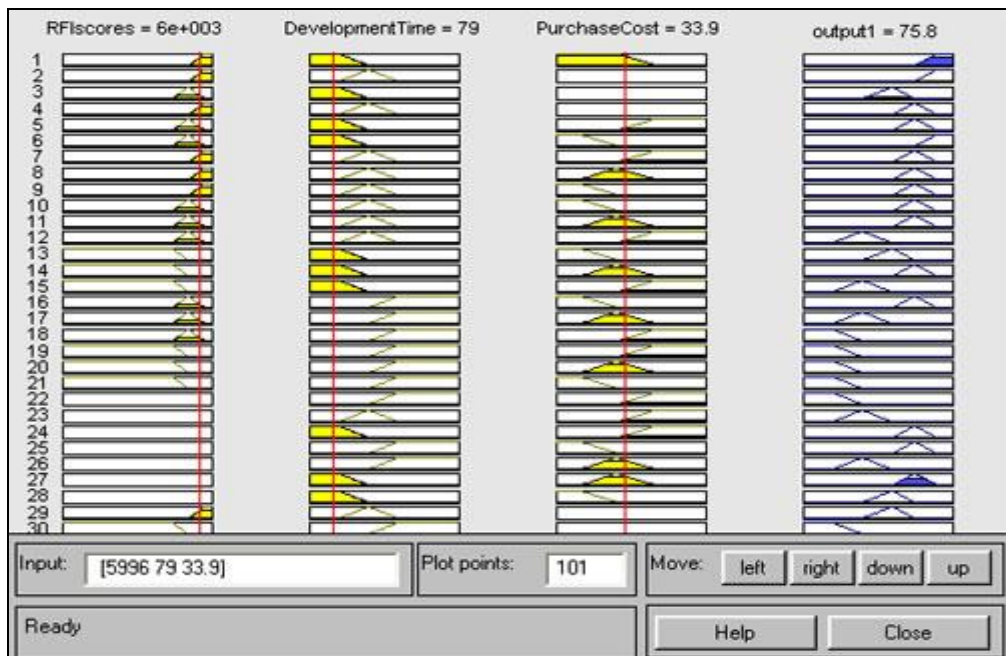


Figure 3.2. TradeShip Score from Fuzzy Engine

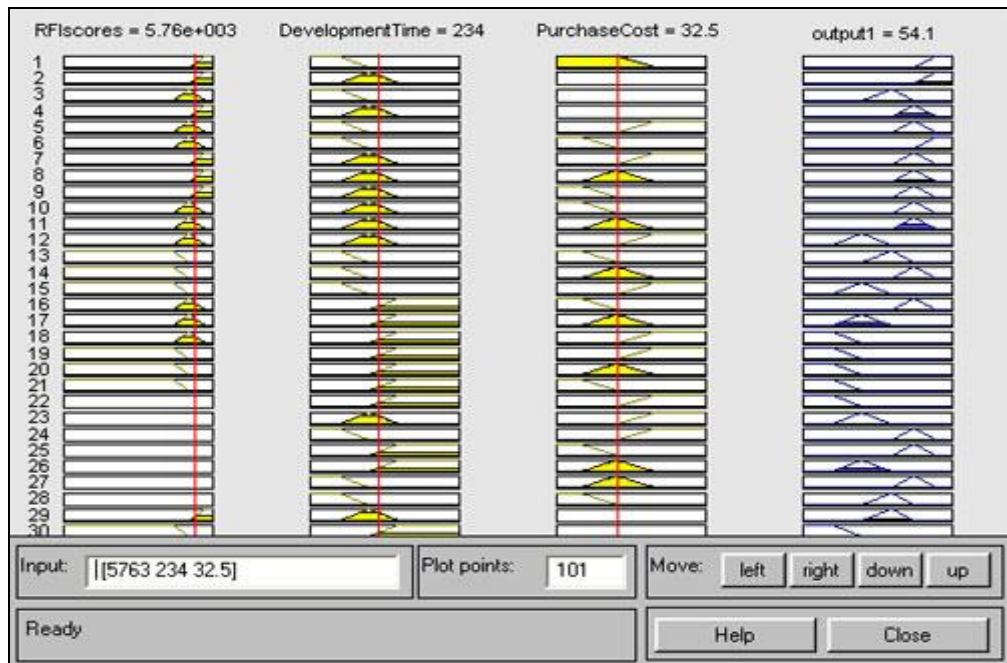


Figure 3.3. Softship Score from Fuzzy Engine

4. DISCUSSION AND CONCLUSIONS

This section discusses the main findings of this study and the limitations of the research at hand. The aim of the study is to investigate the selection of operational software for EMES Liner Shipping Company. Particularly this study is concentrated on the selection criteria and evaluation of responses of vendor companies.

The objectives set for the theoretical part of this study were to describe, from the software acquisition point of view, the important characteristics of the software packages and to construct, based on literature and EMES requirements, a framework for analyzing software acquisitions. In the theoretical part, the acquisition of information systems was first discussed in general level. The discussion then narrowed down to the examination of software package acquisitions. Selection criteria were developed for company operational requirements. A detailed RFI was prepared by key users and IT staff. Five scripted scenarios were prepared for key operations of EMES to be able to evaluate the level of accomplishment of tasks at demonstration level. Companies were invited for product demonstrations with prepared scenarios. Key users and IT staff evaluated demonstrations with a requirements document.

The objectives set for the empirical part of this study were to investigate vendors by the selection criteria and processes of EMES. These issues were investigated by the means of a survey carried out among shipping software companies utilizing the research questionnaire constructed by EMES key users.

Among the findings of this study were shipping lines seek, through shipping software acquisition, improvements to especially equipment management, sales and marketing, accounts and vessel operations.

After acquiring all data for evaluation, a fuzzy approach is designed. RFI Scores, development times, and purchase costs are taken as inputs to Fuzzy engine. The rules and their weights are set by IT members and staff.

This study shows that evaluations which are based on RFI, RFP scores are not sufficient to decide for acquisition of software. The Fuzzy approach showed that best scores may not point out the best product. There are more variables affecting the results like project cost and development time. These variables also should be taken into consideration from the point of company profile and situation.

Software companies generally have good demonstration materials and skills. Scripted scenarios should have a place in demonstrations. Because companies are perfectly prepared for their standard software but not for company business scenarios. It is essential to see the accomplishments of major business cases through their program. On the other hand one should not go on with every promises that sales person says. On contract and implementation phases, there may be extra costs from the items that have been promised as free of charge.

Actually, everything can be done by new technologies, but it is import to decide what is really necessary for company business cases. Purpose of new software acquisition should be crystal clear by all key users; most of the costs come from the requirements that can be classified as cosmetics. Business processes will probably change after the acquisition of the new system. Decisions on changes will be done by business side key users and their project manager. Key users and business side project manager selection is very important to find out right business requirements. Also trainings about software selection and implementation can result effective usage of time and project resources.

There are other factors that can affect the results such as company side visits, companies' previous projects, number of successful projects, visits of companies that are currently using their software and their evaluations on products and project phases. We could not evaluate companies with these variables, this can be a future study for this issue.

APPENDIX A. INITIAL RFI QUESTIONS

Table A.1. Initial RFI Questions

<u>Survey Item</u>	QSN Weight
Vessel Operations	
Vessel schedule module	
<i>Planning parameter details</i>	
Does the system allow multiple vessel details to be captured?	10
Does the system allow the retrieval and update of record by vessel name or code?	10
Does the system allow the use of distance tables?	10
Does the system capture seasonal weather particulars between the 2 ports and the anticipated slow down in speed (by vessel)?	10
Does the system allow retrieval and updates of records based on port names or port codes?	10
Can the system hold port profiles of all the seaports around the world?	10
<i>Proforma vessel schedule</i>	
Does the system automatically extract and generate the Proforma schedule?	10
<i>Actual vessel schedule</i>	
Does the system transfer the information from the Proforma vessel schedule to the actual vessel schedule?	10
Can the system capture all vessel schedule changes by e-mail and/or manually?	10
Does the system alert all changes of ETA to all pre-specified personnel automatically by email or fax?	10
Does the system automatically update the schedule if there is a difference between the captured schedule and the actual schedule?	8
Can the system perform a logical check on the ETA and ETD dates to ensure the vessel schedule change is updated correctly?	10
Does the system automatically alert (by email) if the actual schedule differs from the proforma by more than a pre-agreed timeslot?	10

During the sailing, will the system allow the user to omit or add ports of calls?	
Does the system automatically update the affected port of the schedule and generate an e-mail to advise the pre-specified personnel?	10
If changes to the ETA are made, can the system calculate and recommend an estimated speed for the vessel in order to meet the schedule?	5
Does the system compute and advise the estimated date of arrival in the following scenarios:	
<input type="checkbox"/> Change in port of calls	10
<input type="checkbox"/> Change in vessel speed	10
<input type="checkbox"/> Due to revised schedule	10
<input type="checkbox"/> Change in the rotation	10
<input type="checkbox"/> Ports are inserted or omitted?	10
Does the system allow the user to change the actual vessel schedule particulars online?	10
Does the system allow for double berthing and change of voyage number?	10
<i>Audit Trail</i>	
Does the system provide a full audit trail for insertions, amendments and deletions to all records, to include the log and capture user-id, date, time and place of activity?	10
<i>Vessel schedule enquiry report</i>	
Can the vessel schedule be displayed by service name, vessel name and time period covered?	10
Does the report provide current and past voyages for a specified time period?	10
Does the system display all schedules of vessels which called or were due to call at a certain port within a specified timeframe?	10
<i>Vessel Schedule Integrity Report</i>	
Does the system calculate the different variances of historical voyages between actual and Proforma vessel schedule?	10
<i>Web Publishing</i>	
Can the vessel schedule be exported for web publishing?	8

Operations module

Terminal Departure Report (TDR)

Does the system upload the data retrieved from the port to prepare the TDR for the Port Authority?	10
Does the system capture the data from the tally sheet (list of containers loaded at the port and checked by Tally clerks on site) automatically by EDI?	10
Does the system extract and compile data and convert to Baplie, EDIFACT or Flat file format?	10
Does the system keep track of containers currently onboard vessels and output to Baplie and MCT format?	10
How many characters can be used for the port code?	10
Does the system allow alphanumeric container ISO codes?	10
Does the system allow additional remarks for exceptions e.g.. damage containers?	10
Can the system convert data items from the Terminal Departure Report (TDR) data to MCTS format and vice versa?	10
<i>Dangerous cargo declarations</i>	
Does the system produce the Dangerous cargo declarations?	10
For Carrier Owned Containers(COC) does the system include the following information in the booking module:	
<input type="checkbox"/> Container Number	10
<input type="checkbox"/> IMO Clause	10
<input type="checkbox"/> Commodity	10
<input type="checkbox"/> Number of Packages	10
<input type="checkbox"/> Gross weight?	10
Does the system cross-check all dangerous cargo bookings against the DG declaration and update the booking system?	10
Does the system highlight the DG cargo not been approved by the Operation Department?	10
Using data from the TDR, does the system calculate the port performance, gross and net moves per hour, waiting time, prior berthing and total port time?	10
<i>Report for consortium partners</i>	
Can reports be printed to a file by a slot owner or operator code?	10
Can this report be sent by EDI or email to consortium partners?	10

Does the system collate data for graphical analysis of the types of cargo loaded from a particular port, including laden containers, empty containers, special details, cargo average weight etc? 10

Quotations and Tariffs

Can the system be used to manage the prospect database? 10

Can the system handle sales contact management? 10

Can the user create personalized mail shots? 10

Can the system raise quotations based on the rates and tariffs set per customer (held in the customer profile)? 10

Does the system calculate quotes based on deep sea, air or rail or by using criteria such as customer, cargo type, commodity origin, destination, distance or zones? 10

Does the system provide enquiry screens and reports o give information on quotation status & progress? 10

Can the user have custom built in look-ups & shortcuts to increase the speed of data entry & processing? 10

Sales & Marketing Module

What information can be held in the customer profile?

Tariff/Quotations Module

Does the system hold the following information:

- Production of quotation letters 10
- Spot, contract & tariff rates/pricing 10
- Automatic recall & selection 10
- Hit rate & trend analysis 10
- Full 'lost sale' reports 10
- Initial booking capture 10
- Shipping terms 10
- Copy facility 10
- Expiry dates for quotations 10
- Bottom line calculation 10
- Rates by weight, chargeable weight, volume, package type, per unit, time, distance, percentage, customer etc 10
- Competitor information 10

Bookings

Booking screen

Can the booking screen be customized by the administrator to suit user requirements? 10

Container booking

Creation of new booking

Does the system capture all the container booking details? 10

What information is captured?

On-hold bookings

If the booking exceeds the customers' credit limit, does the system place the booking on hold and alert for approval? 10

Special container booking

Does the system capture all the container booking details? 10

Does the system alert the user for bookings under special circumstances (e.g. Hazardous cargo)? 10

Can the user input remarks for special cargo? 10

Customer information

Does the system provide on-line historical booking information about the customer at the time of booking? 10

Estimated weight table

Can the system hold an estimated weight table? 8

Creation of new booking for new customer

Can the system assign a dummy customer code for a new customer at the time of the booking? 10

Can the system automatically replace the dummy code with the new customer code once they have been approved? 10

Does the system automatically update the booking by extracting all freight charges based on the freight payer? 10

Does the system capture multiple container sizes & types? 10

Amendments

Does the system allow amendments to customer details whilst making a new booking? 10

What data items can be amended?

Can the system perform a global customer update of the changes via EDI?	10
Can the system restrict amendments to users at the original port of creation or at the Principal office?	10
Does the system restrict amendments of freight charges after the tax invoice has been printed?	10
<i>Slot and weight allocations</i>	
During the booking, does the system show slot and weight allocations at the port and terminal?	10
In the event the cumulative weight or slot (including the new booking) exceeds the allocation, can the system restrict the new booking and alert the user to increase the booking allocation?	10
<i>Unique cargo reference number</i>	
Does the system create a unique cargo reference number?	8
Does the system generate the reference number upon capturing the discharge port?	8
Does the system provide an option to generate multiple pre-allocated unique cargo reference numbers before capturing the booking particulars?	8
For bookings with outside carriers does the system allow the manual entry of unique reference numbers which is provided by the outside carriers?	10
<i>Booking activities log</i>	
Does the system capture all of the transactions and activities carried out during the booking into an Audit file?	8
<i>Checking of booking with bill of lading</i>	
Does the system cross-check the number of containers booked on to a particular vessel/voyage against the number of containers in the manifested bill of lading?	8
<i>Customer information</i>	
Does the system allow for the creation of a new customer during the booking?	10
Can the system check the new customer against the list of current customers with the closest spelling?	10
Is there an automatic alert to the relevant personnel to approve a new customer application?	10
Does the system display all the contact information and relevant details for the customer?	10

Can the main contact be added manually during the booking?	10
<i>Basic freight and surcharges</i>	
Does the system capture all the freight charges relating to each customer?	10
Does the system capture all relevant miscellaneous charges pertaining to all ports and download to the Agent systems?	10
Does the system transfer all rates between subsidiary companies?	10
Does the system allow the Agent to maintain freight charges for their own customers?	10
Does the system restrict surcharges to the Principal office only?	10
During the booking, does the system retrieve the vessel's category from vessel details?	10
What is the maximum number of payers of freight allowed by the system?	
Is the user allowed to amend the payer of freight?	10
<i>Booking restrictions</i>	
Does the system allow the user to block or restrict bookings by certain shippers?	10
Does the system restrict bookings by a specified cut-off time for instance the time to ETA?	10
<i>Wait list</i>	
Does the system handle wait list bookings, i.e. taken beyond the booking allocation?	10
How is this indicated on the booking?	
<i>Container release</i>	
Can the container release information be sent to the depot via EDI?	10
Is the shipper automatically advised of the container release information via email and or fax?	10
<i>Auto-freighting</i>	
Using the freight tables, does the system calculate all freight charges into the booking after the booking details are completed?	10
<i>Auto updating of freight amendments</i>	
Does the system automatically update all of the freight charges when changes are made to the freight table?	10

If the bill of lading or invoice has already been generated, does the system automatically alert the freight rate amendments to the appropriate personnel for authorization? 10

Exchange rate

Does the system allow the use of exchange rate information from external applications? 10

Does the system update the exchange rate at all Agent systems on daily basis? 10

How is this done?

Booking list on consortium vessels

Does the system capture the details of the booking of consortium vessels? 10

Transshipment bookings

Does the system incorporate slot allocation for transshipment Carrier Owned Containers (COC) by vessel voyage and final destination? 10

In the event that the transshipment booking exceeds the allocation, does the system automatically send the booking information to pre-specified personnel for approval? 10

If approved, can the booking be updated and the transshipment booking allocation adjusted automatically? 10

If rejected, does the system nominate another allocation? 10

Does the system allow for bookings requiring more than one transshipments i.e. multiple connecting vessels? 10

Does the system monitor the schedule at the transshipment hub if the first carrier is the external carrier? 10

Consortium/outside carrier bookings

Does the system capture the approval code and name of the person that approved the external carrier? 8

Booking confirmation

Can the system send the booking confirmation to the customer by email and/or fax? 10

Is this process carried out automatically? 10

Enquiry Screen

Does the system allow multiple booking screens? 8

Booking cancellation

Does the system provide a full audit trail for booking cancellations?	10
Does the system restrict the cancellation of bookings if a haulier has already been nominated to collect an empty container from depot?	10
Does the system allow manual over ride of booking cancellations?	10
<i>Booking Forecast</i>	
Does the system capture forecast information once the proforma vessel voyage schedule is available in the system?	8
How can the booking forecast details be broken down?	
Documentation Module - Inward	
Bill of lading screen	
Can the user customize the bill of lading screen?	10
EDI of inward manifest data	
Can all inward manifest data be received by EDI	10
Is this data loaded manually or automatically?	
Does the system automatically log all the details of the manifest?	10
Does the system upload the data into the database and alert the documentation staff by e-mail?	10
If the manifest status is full, does the system automatically send an alert via email to specified personnel?	10
Can the bill of lading be created and amended manually?	10
Can amendments to the bill of lading be restricted to authorized personnel?	10
Manifest verification	
Does the system perform manifest data verification for the actual container data against the manifest data?	10
How are discrepancies reported?	
Does the system check that all mandatory data items are completed?	10
How are discrepancies reported?	
Can the system highlight any unbilled bills of lading?	10
How are discrepancies reported?	
Validation of freight rates	
Does the system automatically check the billable freight rates against the minimum allowed in the rates table?	10

If the freight rates fall below the minimum, does the system check against the freight approval table for an approval code?	10
If there is no approval code, does the system automatically alert the user?	10
Does the system report all freight rates below the minimum level?	10
Can the information be sent to approve personnel for authorization?	10
Arrival notice	
Once the inward manifest data is loaded into the system, does the system produce the arrival notice and send it to the consignee?	10
Can the notice be sent by either email, fax or letter?	10
What information can be included in the arrival notice?	
Banker guarantee	
Can the banker guarantee details be captured?	10
LCL unstuffing instruction to container freight station	
Does the system automatically generate an email or fax with the LCL unstuffing instructions to the freight forwarder?	8
Bar-codes on copy bills of lading	
Does the system generate bar codes to print out the copy bill of lading?	5
Cash and cheque receipts	
Can the system read the bar coded bill of lading number and display the relevant information in order to collect cash/cheque at the counter?	5
Does the system record the collection of cash/cheques at the counter and print receipts?	10
Is there an interface to a cheque reader?	5
Can the receipt data be transmitted via EDI into the financial system?	10
How frequently can this be done?	
What method of payment can the system accept?	
Does the system update the bill of lading release indicator once the receipt has been printed?	10
Does the system allow the user to input the bill of lading release indicator at the time of collection at the counter?	10
Correction advice	
If the bill of lading has been amended or deleted, does the system generate a correction advice and send it to the port?	10

Can this be done via e-mail or fax?	10
Does the system prompt the user for a reason code to amend a bill of lading?	10
Does the system restrict amendments once the invoice has been printed and posted?	10
Does the system have the facility to specify a cut off time for changes to the bill of lading?	10

Processing of delivery order

Can the system capture the details of the customer collecting and paying for the delivery order prior to the arrival of EDI manifest data from load port?	5
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Storing order

Does the system produce storing order instructions for the consignee to return the empty containers to pre defined depot after unstuffing the cargo?	10
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Reports, debit notes and manifest printing

Can the system print onto pre-printed forms and blank paper?	10
Does the system automatically log all the user id information once the debit notes are printed?	10
Can the debit note details be linked to the bill of lading information?	10
Can the debit note be cancelled if the user requests a reprint of the bill of lading?	10
Does the system prompt the user for a reason code to reprint the bill of lading?	10
Can the system fax a debit note to a customer upon request?	10
Does the system allow for printing of credit notes?	10
Does the system save debit and credit note information into the audit file?	10
Does the system allow the user to cancel one or more debit notes?	10
Does the system allow the manifest to be printed by:	
<input type="checkbox"/> Bill of lading	10
<input type="checkbox"/> Load or discharge port	10
<input type="checkbox"/> Carrier owned containers (COC) or shipper owned carrier (SOC)	10
<input type="checkbox"/> Full voyage	10
Does the system identify and print any bill of lading not printed?	10
Does the system print the manifest of special containers?	10

Exception reports

What exception reports can be printed?

Security clearance

Does the system restrict amendments to freight charges by authorized personnel only?	10
Does the system allow re-printing or amendments of debit notes once it has been posted to the financial system?	10
Documentation - Outward	
Bill of lading screen	
Can the bill of lading screen be defined by the user?	10
Bill of lading creation	
To prepare the bill of lading does the system provide a list of unique cargo booking reference numbers for the selected vessel/voyage?	10
Can the system produce:	
<input type="checkbox"/> One unique cargo booking reference to one bill of lading?	10
<input type="checkbox"/> One unique cargo booking reference to multiple bill of lading?	10
<input type="checkbox"/> Multiple unique cargo booking references to one bill of lading?	10
Can the system scan attachments (such as cargo description) to link to the bill of lading?	10
Does the system perform on-line verification of the bill of lading data fields against the system reference tables?	10
Does the system record an audit trail for all type of transactions taking place?	10
Does the system allow each bill of lading to be billed with one unit of bill of lading fee?	10
Can the user amend the number of bills of lading to be billed?	10
Does the system extract the bill of lading fee from the customer freight table and compute the total billable amount and update into the system?	10
Can the system capture the status of the bill of lading (e.g. new, updated, deleted)?	10
Does the system restrict the originator and receiver from amending or deleting the bill of lading after a specified cut off time (i.e. a number of hours from the vessel arrival at discharge port)?	10
Does the system allow amendments or deletions based on the correction advice, after the cut off time?	10
Does the system capture all of the other shippers' information in the bill of lading as well as the main shipper?	8

Does the system allow the transfer of the details of the 1st carrier bill of lading onto the 2nd carrier bill of lading creating a new bill of lading number?	8
Can the system set a maximum number of transshipments allowed?	8
Does the system capture the <i>port of issue</i> of the original bill of lading?	8
What is the default?	
What details for cargo release are captured under the bill of lading?	
Can the bill of lading details be copied to create a new bill of lading with a new number?	10
Does the system restrict duplicate bill of lading numbers?	10
Bar-coding of the bill of lading	
Does the system generate bar codes to print on the bill of lading form?	5
Bill of lading number	
Does the system automatically generate a unique bill of lading number only when all the details are completed?	10
Does the system allow the bill of lading number to be generated with partial details?	10
What is the format of the bill of lading number?	
Does the system allow the booking reference number to be the bill of lading number?	5
Can the system generate multiple pre-allocated bill of lading numbers without the completion of the bill of lading details?	0
Bill of lading amendment	
Can the bill of lading details be retrieved by the following:	10
<input type="checkbox"/> Bill of lading number	
<input type="checkbox"/> Booking reference number	
<input type="checkbox"/> Container number	
Does the system check the container numbers of carrier's owned containers (COC) against the numbers in the inventory to ensure that the container number is correct?	10
Does the system allow changes to the bill of lading on-board date and on the date of issue?	10
What restrictions are in place for amendments to the bill of lading?	
Bill of lading release to customers	

Can the user update the bill of lading release indicator?	10
Does the system extract the user-id and the system date and update each bill of lading released to the customer?	10
Manifest verification	
Does the system perform a manifest verification routine?	10
How are discrepancies reported?	
Manifest verification for outside carrier	
Does the system allow manual confirmation of the container data in the manifest against the on board list provided by the outside feeder?	8
Manifest send to Principal office / Agents	
Does the system trigger the sending of EDI manifest data to the Agents and Principal office?	10
What information can be provided?	
Can the minimum freight rates be copied from the Principal system to the Agent system?	8
Cash and cheque receipt & bill of lading release at the counter	
Can the system accept multiple tax invoices to be paid against one receipt?	5
Does the system accept more than one type of payment?	10
Does the system automatically update the bill of lading release once the receipt has been printed?	5
Does the system allow the user to input the bill of lading release indicator at the time of collecting the bill of lading or debit note at the counter?	10
Does the system update all invoices with the receipt number automatically?	10
Reports	
What options are available to print the bill of lading?	
Can a customer defined bill of lading be printed?	10
Is the printing of the freight rates on the bill of lading, optional?	10
Can the container numbers be listed on the bill of lading?	10
Manifest print requirements	
Does the system allow the user to selectively print the manifest showing the through freight for transshipment cargo?	10
Does the system allow the user to print additional data items in the manifest for certain ports which are not shown in the bill of lading?	10

Invoice print requirements

Does the system cater for multiple bills of lading to be billed in a single tax invoice for the same vessel/voyage? 8

Does the system allow one invoice to be generated for multiple bills of lading providing that it is the same payer of freight, or the same vessel or voyage? 8

Exception Reports

Does the system automatically report uncollected bills of lading? 10

What information can be displayed?

Documentation - Transshipment**Slot allocation management by vessel/voyage at transshipment hub**

Does the system pre-allocate the vessel/voyage with the number of slots for loading to each discharging port? 10

Can the system allocate to one or more ex-carrier? 10

How does the system allocate slots amongst the ex-carriers?

Bookings with specified allocation given

If the booking exceeds the allocation at the port, does the system automatically alert the transshipment port for approval? 8

Does the system automatically update the booking once the approval is received? 8

Bookings without allocation

What is the maximum number of TEUs allowed for each port?

Does the system alert the transshipment port with overbooking information for approval? 8

Once the transshipment port confirms the acceptance of the overbooked containers, does the system route the information to the load port? 8

Can the information be transferred to the booking manually and automatically? 8

Outside carrier schedule particulars

Does the system capture the expected arrival time of external carriers? 5

Does the system update the schedule at the respective transshipment hubs via EDI to the Principal office? 5

Does the system capture the schedules of other modes of transportation such as trains, trucks, rail etc.? 5

Transshipment vessel nomination

Does the system allow the user to select a vessel which has the minimum connection time?	10
Does the system allow the user to override the vessel nomination at the transshipment hub?	10
Can the system display a number of available vessels and their details?	10
Does the system automatically select a connecting vessel according to pre-specified criteria?	10
Does the system allow for manual intervention in exceptional circumstances?	10
Can a cut off time be specified for amendments to the destination and containers on hold at the transshipment port?	10
After the cut-off time, does the system allow amendments?	10
What is the security for this?	
Re-nomination of the next connecting carrier criteria	
Can the system re-nominate a connecting vessel, in the event that there is a change to the vessel schedule or it is overbooked?	10
Can the details of the change be sent automatically to pre-specified personnel for approval?	10
Over landed and short landed cargo	
Does the system report over landed and short landed cargo?	10
Does the system automatically inform the Principal?	10
Rollover cargo	
Does the system deal with rollover cargo?	10
Does the system permit split containers under the same through bill of lading in the event of rollover cargo?	10
How does the system deal with seeking approval for rollover cargo?	
Keep-In-View	
Does the system capture information relating to the shipper if the booking has exceeded its pre-specified allocation or the maximum TEU?	10
What information is captured?	
Can the information be sent to the Principal or transshipment hub for approval?	10
Does the system allow the user at the load and transshipment port to transfer the booking and bill of lading from the existing vessel/voyage to the new vessel/voyage?	10

Transshipment performance

What performance measures can the system provide?

Switch Bill of Lading

Can the system create a switch bill of lading if there is a change to the shipment details to be carried out at the port? 10

EDI of switch bill of lading data

Does the system automatically send out the switch bill of lading data to the switch port once the indicator is on? 10

Is the data automatically uploaded to the container shipment management database? 10

Does the system automatically log each transaction into the audit log file? 10

Once the data is uploaded, does the system alert the specified documentation staff by e-mail? 8

Does the system automatically send a notification to the pre-specified personnel if the manifest status is full? 10

Can this be done automatically by email? 5

Arrival Notice

Upon vessel arrival, does the system automatically alert the consignee to produce the required bill of lading documents in exchange of the new set of switch bill of lading? 10

Is this alert sent automatically by fax and/or e-mail? 10

Can the system prompt the user to print the details manually for posting? 10

Does the system automatically copy the bill of lading information into the arrival notice? 10

Can the user specify other information to be printed? 10

Can the user print the arrival notice by :

Load port 10

Local consignee/s or notify party/s 10

Bill of lading number 10

Multiple bill of lading in one arrival notice for one consignee 10

Switch bill of lading data

Does the system allow the original bill of lading to be copied to produce the switch bill of lading? 10

Does the system allow the user to amend the bill of lading information? 10

Creation of switch bill of lading

Does the system allow the user to manually create, amend or delete a switch bill of lading while linking it to the original bill of lading? 10

Does the system allow the original bill of lading to be spilt into a multiple set of switch bills of lading? 10

Does the system copy the original load port bill of lading details to the assigned switch bill of lading and amend at the switch record? 10

Does the system copy the switch bill of lading details onto another vessel voyage for a similar shipment and onto a new assigned switch bill of lading to amend at the switch record? 10

Does the system allow switching of the bill of lading more than once at any port? 10

Can the switch bill of lading be emailed or faxed automatically by the system to the customer? 8

Does the system print the ship certificate from vessel operations module if requested by the customer? 8

Freighting

Does the system allow the billing and collection of the switch bill of lading fees, freight and any other charges? 10

Reports

Does the system allow the user to print a consolidated list of container numbers on the switch bill of lading? 10

Can a statistical report be generated monthly by customer or lad port? 8

What information is included?

Does the system produce debit notes billings? 10

Does the system allow the printing of miscellaneous debit note billings? 10

Does the system log all the information, when the debit note is printed? 10

Can the system raise a credit note when a debit note is cancelled? 10

Are the details of the transaction logged into the audit file? 10

Security clearance

Does the system restrict amendments to authorized personnel only? 10

Does the system prompt for validation by reason codes? 10

Does the system restrict amendments to debit notes once it has been posted to the financial system? 10

Billing

Inward carrier owned containers (COC)

Tax invoice printing

Does the system generate a tax invoice after all freight charges and other local charges have been billed? 10

Can the system print by :- 10

- Bill of lading number
- Customer
- Vessel/voyage

Miscellaneous tax invoice print

For cash accounts customers, can the system generate an invoice number or debit note for all local costs? 10

Does the system allow the invoices and debit notes to be created for non-shipping items (e.g. Staff expenses, advances etc.)? 10

Agent debit note print

Does the system perform the billing for the Agents by Vessel/Voyage based on all prepaid freight charges collected at the load port by Agent? 10

Does the system generate a debit note number as per vessel voyage? 10

Does the system collect freight charges by an Agent other than the load port Agent? 10

Inward shipper owned containers (SOC)

Agency billing

Does the system perform all the billing for the Agent? 10

Does the system validate all freight charges collected locally against the actual freight rates quoted in the customer profile database? 10

Can the user print the details of the validation checks? 10

Does the system prompt the user to overwrite the rates if they differ from the manifested freight rates in bill of lading? 10

Outward carrier owner containers (COC)

Does the system bill all the freight charges and miscellaneous local charges prepaid at the load port? 10

Does the system print charges if the billable amount is zero?	10
For customers with both SOC and COC freight rates, does the system extract and bill correctly based on the manifest container status?	10
Does the system extract the actual freight rates and other charges of the shipper when if the payer of freight is another party?	10
Does the system print additional tax invoices for any extra charges added after the original has been generated?	10
Does this over ride the original tax invoice?	10
Does the system provide an option to use rates dependent on the status of the customer, e.g. a prepaid or collect indicator?	10
Can customers be billed by percentage share?	10
Can customers be billed by either the actual rates or manifested rates?	10
Does the system allow different ports to have different rates?	10
Outward shipper owned container (SOC)	
Does the system print invoices in order to bill the local shipper for rejected cargo at the destination port?	10
Security clearance	
<i>Tax invoices</i>	
Does the system restrict the user to print tax invoices/debit notes once only, unless approved by an authorized party?	10
Does the system automatically cancel the original tax invoice/debit notes if it has not been taken into financial accounting system if a new tax invoice number/debit notes is generated?	10
<i>Miscellaneous tax invoices</i>	
Does the system restrict the printing of tax invoices only once?	10
Can amendments be made to the original miscellaneous tax invoice provided it has not been taken into financial accounting system?	10
<i>Agent debit notes</i>	
Does the system restrict the re-printing of the Agent's debit notes to authorized personnel only?	10
Does the system prevent amendments, cancellations or re-prints once the tax invoices or the Agent's debit notes are posted to the financial system?	10

If requested, can the system automatically fax or email tax invoices to the customer? 10

Credit notes

Does the system issue credit notes to customers? 10

Can a credit note be generated based on user defined criteria? 10

Does the system check that every credit note is matched with a billable active tax invoice or debit note? 10

Does the system automatically check the customer profile for pre-agreed credit note amounts? 10

Main line operators' (MLOs) billing by Agency department

Does the system provide consolidated billings summary reports for a defined period on a monthly basis? 10

Can the reports be automatically emailed to the MLO? 10

Does the system allow different report formats specified by the MLO? 10

Main line operators' (MLOs) billing by trade department

Does the system handle billing for a variety of slot agreements signed between the MLO and the company? 10

Does the system capture a range of surcharges? 10

Does the system allow for the billing for the following:

- Slot agreements 10
- Additional slots 10
- Slot purchases 10
- Freight charges not in manifest 10
- Slot usage 10
- Way port billings 10

Round trip billings

Can the system cater for reefer and out of gauge (OOG) containers as separate billings? 10

Way port or cross port billings

Can the system bill by vessel/voyage (i.e. the total billings by total TEUS for empty or laden containers)? 10

Per cycle billings

Does the system calculate slot agreements and bills each cycle, with each cycle consisting of one or more vessels or consortium vessels?	10
Does the system calculate the total TEUs for both inbound and outbound voyages, subtracting the agreed TEUs and bill for the balance?	10
Does the system allow for DG, OOG and Reefer containers?	10
<i>Per vessel voyage billings</i>	
Does the system capture billings as per vessel voyage?	10
<i>Slot purchase agreement</i>	
Does the system capture the balance container after subtracting the number of containers as per the slot agreement?	10
Does the system cater for reefer and OOG containers?	10
<i>Weekly billing</i>	
Does the system capture all vessel sailings within a given week and bill for the slots used exceeding the agreed TEUs?	10
<i>Stevedore billings</i>	
Does the system capture the tariff and bill according to the closing time for each voyage?	10
<i>Slot purchase tier rates</i>	
Does the system cater for slot purchase, i.e. the rates based on the tier rate and corresponding volume?	10
<i>Store rent</i>	
For SOC, can the system consolidate and bill all the containers in a month from the rates on the invoices submitted to the Agents?	10
<i>Per trip billings</i>	
For OOG cargo does the system capture the additional slots utilized?	10
<i>Revenue pooling billings</i>	
Does the system capture the number of containers, based on each partner's contributions?	10
Does the system allow the billings to be extracted by the following criteria:	
<input type="checkbox"/> Date / period	10
<input type="checkbox"/> Vessels	10
<input type="checkbox"/> Vessel/voyage	10
<input type="checkbox"/> Port pairs	10

<input type="checkbox"/> Weekly	10
Does the system provide an option to amend the exchange rates?	10
<i>Agent's auto billing module</i>	
Does the system allow the Principal to bill the Agent for all freight charges collected at their ports?	10
Can the Agent update the following information:	
<input type="checkbox"/> The port code	10
<input type="checkbox"/> Billable currency	10
<input type="checkbox"/> Classification code	10
<input type="checkbox"/> Debit Agent code	10
<input type="checkbox"/> Credit indicator (v=voyage account and g=general ledger account)	10
<input type="checkbox"/> Credit account number	10
<input type="checkbox"/> Date of transaction creation	10
<input type="checkbox"/> User-id of transaction.	10
Can the system bill one port with multiple Agents?	10
Does the system provide a validation list sorted by collectable ports for incoming and outgoing vessels?	10
Does the system provide an option to generate an Agent's debit notes by selecting either the port or the vessel/voyage?	10
Does the system extract and capture the billing data from the bill of lading?	10
<i>Intercompany billing</i>	
Does the system handle inter company billing?	10
Container Tracking	
Movement tracking	
The system must accept data from a variety of sources to track container movements, e.g.:	
<input type="checkbox"/> EDI from external parties such as Agents, depots/ports, leasing companies, etc.	10
<input type="checkbox"/> EDI of data from the internal system	10
<input type="checkbox"/> On-line data entry	10
<input type="checkbox"/> Web data-entry by low volume Agents	10

Data verification process*EDI data verification process*

Does the system carry out verification checks for data received via EDI?	10
Does the system check each container event is a logical movement against the user defined workflow parameters?	10
Are data fields requiring a code, such as a port code, verified against those in the system reference file?	10
Does the system perform a container number ISO check-digit validation on all container numbers?	10
Does the system report on errors?	10
Can the error list be automatically sent to specified personnel?	10
<i>On-Line Data Entry</i>	
Does the system perform on-line real-time checks of all data fields against the system reference file?	10
Does the system prompt the user if the input data is incorrect or non-existence in the system reference file or the container inventory master file?	10
In the event that the container number has failed the ISO check-digit validation, does the system prompt the user to accept or reject the number?	10
<i>Data updating into container inventory master file</i>	
Once the container verification process is completed, does the system create and update the container movement record in the container inventory master by vessel voyage together with its chargeable account? The chargeable account should be based on the service code obtainable from the system reference file.	10
Does the system automatically log all mandatory data fields to the audit log date, time and user stamped?	10
<i>Deletion of container movement record</i>	
Does the system perform container number verification checks against the container inventory master?	10
Does the system log the deletion into the audit log for possible cost reversal?	10
What details can be held on the container particulars record?	
Does the system prompt the user for the required data fields for each type of container movement?	10
On-hire movements	
Does the system allow on-hire movements of containers?	10
Does the system capture the user input in the container on-hire booking file?	10

What information is captured?	
Does the system allow mandatory data fields for on hire container movements?	10
Does the system automatically update the lease agreement number into the on-hire movements when the booking reference is updated into the container inventory master file?	10
Does the system track all on-hire movements and amend the stock inventory accordingly?	10
Off-hire movements	
Does the system deal with off hire movements?	10
Does the system track all off-hire movements and amend the stock inventory accordingly?	10
Does the system allow mandatory data fields for off-hire movements?	10
Loss of container	
Can lost container to be classified as:	10
<input type="checkbox"/> Temporary	
<input type="checkbox"/> Actual total	
<input type="checkbox"/> Constructive total?	
If the loss of container is classed as temporary, does the system include the container as part of the stock inventory?	10
If the loss of container is classed as actual or constructive, does the system exclude the container from the stock inventory list?	10
Does the system allow mandatory data fields for loss of container movements?	10
Sale of containers	
Container sales should be reported as:	10
<input type="checkbox"/> Sold as scrap.	
<input type="checkbox"/> Sold as second-hand units	
<input type="checkbox"/> Sold to Shipper/Consignee	
Does the system allow mandatory data fields for sales of container movements?	10
Export movements	
Does the system allow for the following export movements?	10
<input type="checkbox"/> Empty release to shipper	
<input type="checkbox"/> Arrival of export container at terminal / port	
<input type="checkbox"/> Loaded on vessel	

For containers on transshipment, does the system capture the transshipment status and its expected final destination port? 10

Does the system allow mandatory fields for export movements? 10

Import movements

Does the system allow for the following import movements? 10

- Container discharge
- Collect by consignee
- Empty return of container

For containers on transshipment, does the system capture the transshipment status and its expected final destination port? 10

Does the system allow mandatory data fields for import movements? 10

Inter-modal movements

Does the system allow inter-modal movements such as rail, road, air from point to point? 10

Can the system set mandatory fields for inter-modal movements? 10

Housekeeping

Does the system automatically purge obsolete container historical movements if they are later than a specified date? 10

Does the system archive all the purged data? 10

The virtual container pool

Does the system calculate costs such as empty storage and lift-on/lift-off charges and allocate them to their respective services based on agreed rates? 10

Does the system allocate the costs to a service when the empty container is released to shipper, based on the through freight earned by the main carrier, till the empty container is released for the next service? 10

Does the system cater for lump sum arrangements as well as shipper owned containers (SOC) and carrier owned containers (COC)? 10

Demurrage and detention

Does the system calculate detention and demurrage? 10

Does the system generate an invoice for detention and demurrage charges incurred in a specified time/period? 10

Can an enquiry be run for detention and demurrage incurred by an individual container? 10

Does the system restrict waiver of detention and demurrage charges to authorized personnel only? 10

Free days

Does the system allow for a specified number of free days/free periods in the contract? 10

Container depreciation particulars

Does the system calculate depreciation based on container manufacturing dates/pickup dates/depreciation policy or salvage value? 10

Depot reporting

Can the system report on container movements whilst it is in the depot, including repair details? 10

Release Order

Once the container is released for export to the shipper's appointed haulier, does the system carry out the following:

Cross-check the booking system for the cargo booking reference number? 10

Release the container from depot/yard and update the system on which container number is allocated? 10

Capture the container grading from the point of turning in to the depot? 10

Storing order

Does the system allow the assignment of empty container storage into respective depot/yard? 10

Tariff

Does the system calculate the depot and port costs based on agreed tariffs? 10

Survey cost

Does the system capture the estimates of repair and date of survey for the Principal office or overseas Agents? 10

Maintenance and repair function

Does the system capture all repair and maintenance costs from the repair vendors such as depots? 10

Does the system verify the repair estimates based on the agreed repair tariffs producing an approved estimate? 10

Does the system verify repair invoice from repair vendors against the approved estimates? 10

Does the system track spare parts? 10

Third party recovery function

Does the system capture third party repair costs from approved repair estimates? 10

Can the system store an image of the damaged container after the survey to facilitate insurance claims or recovery from the insurer or liable claimants? 10

Can this information be stored in the containers inventory master file? 10

Special container care

Reefer containers

Does the system log temperatures and alert the user if it falls out of the pre-set range? 10

Does the system capture the reefer temperature at the point of booking and compare it to the built-in reference benchmark to recommended the optimum commodity storage temperature? 10

Open top

Does the system capture the condition of tarpaulin? 10

Does the system capture the number of roof-bows of every open top container? 10

Flat rack

When an empty container movement is logged into the system, it should prompt the user to enter if it is bundled or individual? 10

If there is more than one unit, does the system prompt the user to enter the number? 10

Insurance

Does the system calculate the premium payable for containers based on agreed rates and chargeable days? 10

Does the system calculate reverse charges such as overcharging or underpayment? 10

Does the system capture daily premium rates adjustment and amendments? 10

Container rental function

Does the system handle container leasing by the Principal? 10

Does the system capture the leasing record? 10

Invoice verification

Does the system calculate the leasing charges of each container? 10

Does the system calculate debit/credit reversal? 10

Container utilization advice

Does the system calculate container leasing expenses (e.g. rental) incurred by third parties? 10

Container sub lease rental

Does the system capture all container subleasing- details from third parties? 10

Does the system generate subleasing bills based on the days utilized and agreed sublease rates? 10

Does the system generate a debit note for outstanding settlement? 10

Reports

Overdue reporting

Does the system produce a report on the containers overstaying or idling at a particular location over a specified period of time? 10

Management statistics

Does the system report on and off hiring for container projections for management analysis? 10

Monthly on and off hire reporting

Does the system calculate the number of units on and off hired, direct interchange (DI) costs over a specified month? 10

Monthly cost allocation report

Does the system calculate the cost allocation and report on a monthly basis? 10

Fleet profile report

Does the system capture the fleet profile of containers based on various types of leasing agreements? 10

Container projection on-line (Principal)

Does the system provide on-line and real-time update to the stock figures to project the accurate container status in the inventory to enable management to forecast and plan for short term and long term logistics deployment? 10

Agents performance gauge

Does the system provide an analysis of Agents' performance by:

Agents projection verses actual figures 10

Container turnaround time vs. target (budget) 10

- | | | |
|--------------------------|--|----|
| <input type="checkbox"/> | Container activities reporting efficiencies vs. target | 10 |
| <input type="checkbox"/> | Third party recovery (to specify whether liable party is load or discharge port) | 10 |
| <input type="checkbox"/> | Demurrage and detention collection | 10 |
| <input type="checkbox"/> | Direct on and off hiring | 10 |
| <input type="checkbox"/> | Off hiring performance etc. | 10 |

Container Forecasting

- | | |
|---|----|
| Can the data be linked to a specialized forecasting module? | 10 |
|---|----|

Sales and Marketing

Customer visit particulars

- | | |
|---|----|
| Does the system allow the sales person to update all the details of the customer visit? | 10 |
|---|----|

What information can be included?

- | | |
|---|----|
| Can the records be sorted by customer and visit date? | 10 |
|---|----|

- | | |
|--|----|
| Can the records be retrieved by customer, date, nature of visit etc? | 10 |
|--|----|

Customer support service

- | | |
|--|----|
| Can the system capture customer complaints or other remarks? | 10 |
|--|----|

- | | |
|---|----|
| Does the system send the details of the customer visit to specified personnel in order to add actions or other details? | 10 |
|---|----|

- | | |
|---|----|
| Can this be done automatically or manually by email or fax? | 10 |
|---|----|

Global customer profile

What details can be included in the global customer profile?

- | | |
|--|----|
| Does the system allow the user to amend any of the customer profile details? | 10 |
|--|----|

- | | |
|--|----|
| Does the system provide the option to capture and update the details of the shipper's customers? | 10 |
|--|----|

- | | |
|--|----|
| Does the system allow the customer code to include its subsidiary companies? | 10 |
|--|----|

Customer booking forecast

Does the system capture the customers' booking forecast by:

- | | | |
|--------------------------|------------------------------------|----|
| <input type="checkbox"/> | Container size/type | 10 |
| <input type="checkbox"/> | Estimated date of shipment | 10 |
| <input type="checkbox"/> | Shipping operating Agent indicator | 10 |
| <input type="checkbox"/> | Remarks | 10 |
| <input type="checkbox"/> | Date/time/operator -id of marketer | 10 |

Does the system restrict the creation, amendment and deletion of bookings to authorized personnel only? 10

Does the system allow the user to print a forecast by period and estimated date of shipment? 10

Deletion of inactive customers

Can the system flag customers that have been inactive for a specified period of time to be deleted? 10

Is this function restricted to authorized personnel only? 10

Does the system perform a validation check to ensure that the inactive customer is not in use before it can be deleted? 10

Creation of new customers

Before creating a new customer, does the system cross-check the name with a list of current customers with the closest spelling to avoid duplication? 10

Does the system send the new customer details to authorized personnel for an approval code? 10

Are the details captured in the audit log? 10

Sales lead

Does the system capture the details of the sales lead? 10

What information is captured?

Does the system send the information to specified personnel for follow up the sales lead? 10

Can this be done automatically by email or fax? 10

Does the system produce an exception report of the sales leads that have not been followed by the marketers? 10

Administrative credit

Can the marketer enter any special remarks about the customer for the counter staff? This should be automatically displayed at the point of cash or cherub receipt. 10

Customer service

Does the system provide on-line information on customer enquires? 10

What information is provided?

Enquiry

Can the user make enquire about customer accounts? 10

Reports

Can the system produce user defined marketing performance reports? 10

Trade Module

Monitor booking

Does the system allow the user to have on-line monitoring of all load Agents' liftings? 10

Can the following be provided:

Service code i.e. The last access service code or a list of services to select? 10

All the vessel voyages falling within the covering period to display the load port's summarized total container units and TEU? 10

A breakdown by each container size/type by each load port and from the load port to view all the corresponding discharge ports? 10

A breakdown by final destination and container size/type by discharge port? 10

Can the user customize the enquiry screen? 10

Freight rates

Does the system capture the freight rates based on port pairs and copy them to the load Agents? 10

Does the system retrieve the freight rates and other miscellaneous charges from the freight table, update into bookings and post to the bill of lading? 10

Does the system allow the Agents to alter the freight rates provided the amended rates does not fall below the minimum freight rate? 0

Does the system restrict the reprinting of bill of lading when the freight rates have changed? 10

Does the system automatically generate an e-mail to authorized personnel at the Principal office for approval to alter the freight rates? 10

Once approved, does the system automatically update the Agent with an approval code to be captured in the bill of lading? 10

Monitor vessel schedule

Does the system provide proforma and actual schedule details with changes logged into a historical file? 10

Monitor cost control

Yield management

Does the system capture and maintain the unit cost? 10

Agent disbursement

Does the system capture the costs incurred at each load or discharge port? 10

Monitor feeder costs usage

Does the system capture and maintain the following:

- All outside carrier's schedules, freight & miscellaneous costs by port pairs? 10
- List of approved shipping lines for transshipment? 10
- Carriers not on the approved list and their head office approval codes? 10

Monitor Agent performance

Using the booking information and the container management information, can the following reports be generated:

- Actual liftings against budget 10
- Equipment turnaround 10
- Level of services provided 10
- Accuracy of bill of lading 10

Monitor vessel position

Can trade users be updated with the status of the vessel position? 10

Can the vessel position be monitored by multiple selection criteria i.e. service code, period etc? 10

Monitor profit & loss

Can the profit and loss account be monitored through the following:

- Yield management 10
- Terminal departure report (TDR) 10
- Manifest data 10
- Freightage 10
- Agent disbursement module? 10

Enquiry and reporting tools

Does the system contain end-user query and reporting tools to enable users to present in charts and graphs and drill down the details for analysis? 10

Does the system offer a revenue optimization tool? 8

Agency Disbursement

Freight control module

Electronic debit note system from Principal to Agents

- Does the system generate a unique serial-number for the debit notes upon receiving the freight manifest? 10
- The debit note should include full freight details by vessel voyages and by bill of lading. 10
- Can the debit note, taken from the freight manifest, be addressed to the freight paying Agent? 10
- Does the system automatically update debit note details to the financial system? 10

Electronic credit note from the Agents to the Principal

- Does the system generate a unique serial number for the Agents' credit note? 10
- Does the system alert the Agent to prepare an electronic credit note after receiving the debit note from the Principal? 10
- Can the Agent automatically credit by vessel/voyage and by bill of lading? 10
- Does the system update the credit note information automatically to the financial system? 10

Reconciliation process

- Does the system automatically match debit and credit notes in the shipping system and update the information to the financial system? 10
- Does the system generate a list of non matched bills of lading by vessel/voyage? 10

Agents' ageing report

- Does the system produce an analysis for the Agent of aged non credited freight? 10
- Can further drill down queries be carried out? 10

Disbursement control module

- Does the system capture all the Agent's disbursements data to transmit electronically? 10
- Can this be done by EDI? 10

Standard costing

- Does the system capture the standard unit cost details and allow the retrieval and update of the records? 10
- What details can be included?

Disbursement auto-verification

Does the system check disbursements input at the Agent's office against the costs from a set of tariffs and bases? 10

Does the system allow the Principal to update standard cost tariffs? 10

For costs variances, can the system prompt the Agent for an explanation? 10

Does the system generate a cost variance report at the Principal's office for further analysis? 10

On-line checking and approving capabilities

Does the system allow on-line checking & approving by various parties, such as: 10

- Port charges - by Operations
- Terminal charges - by Trade Finance
- Feeder charges - by Trade Finance
- Land cost - by Logistics
- Owner expenses - by Voyage-Owners
- Equipment expenses - by EMD

Once the disbursements have been approved, does the system post them to the financial system? 10

Reject / On hold capabilities

Does the system allow the Agent to reject or hold invoices in the disbursements? 10

Yield Management

Contribution analysis model

Does the system provide a contribution analysis for performance evaluation? 10

The following should be available for analysis? 10

- Analysis by shipment by port-pairs
- Analysis by port by period
- Analysis by sector by period
- Analysis by vessel voyage by service
- Analysis by vessel by service

Statistical data

Does the system extract and provide statistical data for feasibility studies? 10

Budget particulars

Does the system capture the budget particulars to facilitate variance analysis between proforma and budget performance? 10

Budget variance

Does the system calculate the variance between the voyage proforma and the budget particulars and generate a variance report for analysis? 10

EDI (Electronic Data Interchange)

Can the system capture the data at source and transmit as a EDI file? 10

Does the system cover external and internal EDI needs? 10

Does the system interface to an EDI translator server to receive and output data to the database server? 8

What client server environments can the system run?

Can the system run as a stand-alone application or integrated into business applications? 8

Does the system run several translations process and real-time update the database? 5

Can the system provide an event scheduler to allow users to fully automate their EDI processing? 8

Type of EDI Messages

Does the system provide EDI links between the following? 10

- the Principal and its trading partners?
- Between applications within the Principal company?

What EDI message files are supported?

Industry Integration

Does the system support links to the shipping industry portals? 5

Which ones?

Hazardous Cargo

Does the system handle hazardous cargo approvals via the internet? 10

Agent module

Can the Agent to submit bookings over the web? 8

Can the Agent update the booking status from the dangerous goods department over the web? 8

Does the system automatically check the booking for stowage and segregation restrictions in accordance with international guidelines and regulations? 10

Does the system check the booking for restrictions specified by the port, vessel, operator, line or service? 10

Does the system generate and decode UN EDIFACT messages? (IFTMBF/IFTMBC)	10
What security access does the system have?	
Dangerous goods (DG) office system	
Can the DG office view all the current bookings by Agent or vessel?	10
Can the database be searched by multiple criteria (E.g. UN number, commodity name etc)?	10
Does the system have a database of restrictions by UN number, IMO class, weight limit, port permits for different ports, ships or operators?	10
Can the booking list to be managed for each port in rotation?	10
Can the following standard reports be produced:	
<input type="checkbox"/> DG loading summary	10
<input type="checkbox"/> DG manifest	10
<input type="checkbox"/> Port transit report	10
<input type="checkbox"/> Port weight tables	10
<input type="checkbox"/> Jeddah DG summary	10
<input type="checkbox"/> DG List?	10
Does the system generate and decode UN EDIFACT messages (IFTDGN/IFTIAG)?	10
Can the system set up of port rotations per vessel?	10
Can the system be used to forward plan hazardous cargo?	10
Does the system allow transshipments from vessel to port and port to vessel?	10
Does the system allow the user to set up a hub port for transshipment?	10
What security access arrangements are in place?	
Invoicing and Costing	
Does the system handle the billing and costing of consignments and provide an on-line view of profitability at multiple levels?	10
Can consignments be automatically priced and cost calculated?	10
Does the system calculate expected profit/contribution for management decision making?	10
Can the user produce reports to monitor performance?	10
Can the system use a pricing matrix with multi-level analysis codes?	10
Does the system store standard tariffs and also uplifts to the standard costs?	10

Can the system calculate the expected costs per route?	10
Can the user add costs manually?	10
Does the system capture actual costs and allocate them to estimates?	10
Does the system allow the Principal to manage Franchisee and Agents?	10
Does the system allow larger suppliers to self bill?	5
Does the system process invoice and credit notes?	10
Does the system allocate revenue and costs to consignments and/or containers?	10
Does the system contain a scheduler for invoice production?	10
Which accounting systems can the system interface to?	
Does the system have its own Integrated financials?	5
For management analysis, can the user drill down from the invoice to the source of revenue?	10
Does the system have a notepad facility for the user to make special remarks regarding pricing and costing?	8
Does the system have an integrated voyage ledger?	8
Does the system have an integrated Agent's ledger for processing of disbursements?	8

APPENDIX B. QUOTATION SCENARIO

Istanbul agency of Arkas is responsible for Marport, Kumport, Soyak and Haydarpaşa ports. Zorlu Holding A.Ş. requests a quotation from Arkas Agency. Zorlu Holding A.Ş. has some sub companies, and wants its companies to use same quotation given to Holding. This agency will prepare a new quotation for this customer. The necessary information to prepare a quotation for Zorlu Holding will be described in the document.

Customer Details:

Table B.1. Customer Information

Customer Name	ZORLU HOLDING A.Ş.	STEPHAN
Customer Type	Shipper/Booking Party	Consignee
Address	Doğu Caddesi No :15 34564 KARTAL/ İSTANBUL	Apartado 39, 20120 Hernani, GUIPUZCOA, SPAIN
Phone	+90 216 321 32 35	+34654 565 6554
e-mail	myilmaz@binoks.com	msosa@hotmail.com
Contact Person	Mehmet Yılmaz	Marcello Sosa

Shipment Type & Corridor Details:

Zorlu Holding A.Ş. wants to load from Ankara to Madrid on 12th of August 2005. Transportation will be “Place of Receipt to Door” basis. Arkas will be responsible for the whole transportation (Sea and Inland).

There’s a depot at Ankara and empty container will be taken from Ankara depot for stuffing , which means that we won’t send any empty container from Istanbul to Ankara. So, one-way trucking rate will be applied. If we send it from Istanbul, roundtrip trucking rate will be applied. Containers will be taken from Ankara and carried to Istanbul by truck and railway.

The containers, loaded from Istanbul will be discharged at Valencia port. Then from Valencia to Madrid containers will be carried by truck and railway combined.

Table B.2. Shipment Type and Corridor Details

<i>Term</i>	Door to Door
<i>SOC/COC</i>	COC
<i>P/M</i>	Metric
<i>FAC Applicable</i>	No
<i>POR Haulage</i>	Carrier
<i>POR</i>	Ankara
<i>POL</i>	Istanbul
<i>POD</i>	Valencia
<i>DEL</i>	Madrid
<i>DEL Haulage</i>	Carrier
<i>Shipment Date</i>	12.08.2005
<i>Rate Basis</i>	POR to DEL

Commodity and Container Details: ZORLU HOLDING has different types of goods to be shipped with different types of containers. To carry Construction Machinery, OT (Open Top) containers are used and each of these containers causes two killed slots. Company ships 20 containers in total.

Table B.3. Load Information

	1 Loading	2 Loading	3 Loading
Container Details			
Size	20	40	40
Type	DV	HC	OT
Rate Type	Normal	Normal	OOG
Quantity	10	5	5
Void Slot			5*2=10 slots

Commodity Details			
Commodity	Refrigerators	TV	Construction Machinery
Rate Type	Normal	Normal	OOG

Route: Agency selects direct or transshipment in routing tab. From the product catalogue appropriate service is selected.

Charges: In the charges tab, agency clicks get charges button to generate charges. These charge and surcharges come from guideline rates. Agency changes freight charges as written above. On comments tab, agency enters “ZORLU is an important customer for us, please approve rate changes”.

Table B.4. Charges

	Loading 1	Loading 2	Loading 3
Guideline Rates	1500 USD	4000 USD	5400 USD
Surcharges			
HC surcharge	-	150 USD	-
OT surcharge	-	-	300 USD
OH Surcharge	-	-	10*100=1000 USD
IMO surcharge	-	300 USD	-
BAF	80 USD	160 USD	160 USD
CAF	% 10 of Sea Freight	% 10 of Sea Freight	% 10 of Sea Freight
Primage	% 5 of (Sea Freight + BAF+ CAF+IMO+OTs+OHs+HCs) *Primage is applied only for the loadings from Turkey ports.		
Pre-carriage (Ankara - Istanbul)			
Trucking	250 USD / CNTR		
Railway	250 USD / CNTR		
THC	70 USD / CNTR		
DOC	40 USD / BL		
On-carriage (Valencia - Madrid)			
Trucking	350 EUR / CNTR		

Railway	350 EUR / CNTR		
THC	126 EUR / CNTR		
DOC	26 EUR / BL		
T-3 Commodity	3 Eur + 0.78 Eur/Tn	6 Eur + 0.78 Eur/Tn	6 Eur + 0.78 Eur/Tn
Changes made by Agency on Guideline Rates	1300 USD	3700 USD	5000 USD

Detention & Demurrage: On Detention demurrage tab, agency clicks “Get Detention Demurrage Rates” button to get standard port rates.

Before the loading, on 01.08.2005, Port of Loading agency requests additional demurrage Free Time. Standard Free Time at Valencia port is 7 days but agency requests 14 days.

Standard demurrage Free Time at Valencia port is 5 day but consignee returned the empty containers in 10 days. Port of discharge agency requests % 50 discounts from the demurrage invoice.

Close Quotation Agency saves and then closes the quotation. When a quotation is closed a notification should be sent to the responsible person at HQ. System should get approval for the rate changes.

Quotation Approval: Responsible person at HQ enters to the system and notices there is a quotation waiting for approval. Details of quotation should be seen by clicking it. In contribution margin tab responsible person can see profit and costs of this carriage and decides weather approve or reject the requested discount. If the charge is not approved HQ changes the status of quotation to “quote again”, and writes a comment “rates are not acceptable we can give only %5 discount for your customer”

Agency gets a notification from system that quotation is not approved and sees the comments written about this rejection. Agency contacts with the customer and agrees on charges. Then Agency changes quotation rates according to HQ comments.

Table B.5. Charge Approvals

				Responsible	Comments
Guideline Rates/ Teu	1500	4000	5400		
Agency Offer	1300	3700	5000	Agency	Zorlu Holding is an important customer for us, please approve rate changes
Approval	Rejected			HQ	Rates are not acceptable we can give only %5 discount for your customer
Agency Second offer	1425	3800	5130	Agency	Rates are changed as you offered
Approval	Approved			HQ	

Finalizing Quotation Agency gets a notification about the approval of quotation. Agency opens the quotation checks if there is any necessary change before finalizing. After checking tabs, agency clicks the “finalize” button. Quotation now can be used for preparing bookings.

BOOKING CREATION FROM QUOTATION

Agency creates a booking for customer Vestel Beyaz Eşya A.Ş using the quotation, which is already approved by the HQ. This quotation was prepared for Zorlu Holding and can be used by Vestel also.

Agency selects the booking party and then retrieves the list of quotations given to this customer from the system. System should show group companies’ quotations while listing. According to the effective dates, agency chooses the appropriate quotation. Quotations which are not effective should not be used for booking creation.

By clicking the “Generate Booking” button, booking screen opens. The basic information like customer, commodity, container etc. comes directly from the quotation.

Commodity can not be changed if booking is created from quotation. System should send notifications of any type to notify parties.

Table B.6. Customer Information in Booking

Customer Name	Vestel Beyaz Eşya A.Ş	STEPHAN	Vestel Beyaz Eşya A.Ş	ZORLU HOLDING
Customer Type	Shipper/Booking Party	Consignee	Bill to Party	Notify Party
Adress	Doğu Caddesi Vestel Dağıtım Deposu 34564 Kartal/ İstanbul	APARTADO 39, 20120 HERNANI, GUIPUZCOA, SPAIN	Doğu Caddesi Vestel Dağıtım Deposu 34564 Kartal/ İstanbul	Doğu Caddesi No:1 34564 Kartal/ İstanbul
Phone	+90 216 321 32 35	+34654 565 6554	+90 216 321 32 35	+90 216 875 87 65
e-mail	myilmaz@binoks.com	msosa@hotmail.com	myilmaz@binoks.com	zorlu@zorlu.com.tr
Contact Person	Mehmet Yılmaz	Marcello Sosa	Mehmet Yılmaz	Mehmet Zorlu

Equipment Tab: Agency selects containers for this booking according to the size, type, quantity of containers specified in quotation. Agency makes movements for these containers. First Agency assigns available containers for this booking and containers are sent to shipper.

Routing Tab: Agency selects the voyage from product catalogue.

Charges Tab: Agency clicks “get charges” button to obtain charges defined in quotation. Agency should not be able to change rates.

Booking Confirmation: Notify Operations Department for the confirmations about Slot approval, over booking, cut-off time, DG Cargo, Special Cargo, OOG Cargo.

BOOKING FROM GUIDELINE

If a quotation is prepared from guideline rates, agency can use quotation to create bookings without any approval. Also agency can create booking directly from guideline rates without using quotation.

BOOKING FROM CONTRACT

A customer who has a contract in the system comes to the agency and requests a booking. Agency creates a booking for this customer from the relevant contract without requesting a quotation.

APPENDIX C. OPERATIONS SCENARIO

Vessel And Service Creation: Create Vessel Lucian G.A in the system by entering the necessary details below.

Table C.1. Vessel Information

Vessel Name	LUCIEN G ARKAS	Depth	14,20
Vessel Code	LUC	Summer Draft	9,00
SAP Code	NVO	Air Draft	0,00
Vessel Type	Feeder	Summer Dwt	17264
Flag	TR	Consumption at Maneuvering	
Port of Registry	TRIZM	Consumption at sea	
Ownership	Outside Feeder	Consumption at port	
Vessel Operator	XCL	International Tonnage	
Build Year	2001	Service Speed	19,3
LOA	15,56	Cargo Dead Weight	
LBP	15,56	Operational TEU capacity	1221
Breadth	1500,00	Tons per TEU	14

Create Aegean / Spain Service with the details below.

Table C.2. Aegean / Spain Service

Service Code	AS	SAP Service Code	532
Service Name	Aegean Spain Service	Consortium Service Code	GA
From Date	01.01.2001	Service Group Code	LP
To Date	31.12.2006		
Service Category	Anchor Service		

VESSEL SCHEDULE GENERATION:

Necessary Setups to be done in the system are like following:

Port Distances: From Port, To Port, Distance is entered. When necessary user can make a “distance” search entering the port pairs. In the scenario the port of calls are the following:

Valencia – Barcelona – Piraeus – Thessalonica – Marport - Haydarpaşa – İzmir –
Tunis – Valencia

Proforma Schedule Entry: First off all a proforma schedule is prepared. In the Proforma Schedule; service is selected. Then the service directions, port of calls, the terminals, the port types (Loading, discharging or both), ETAs (Estimated time of Arrival), ETDs (Estimated Time of Departure) are sequently entered.

Due to these given days, system calculates automatically the port stay times. After entering all the ports, then the total voyage duration is also calculated by the system.

In addition to the data above; transshipment ports, turn ports are to be specified in the proforma.

Service : Aegean / Spain
Transshipment Port : Marport
Turn Port : Marport

After all the information is entered to the system, each proforma is saved with a unique proforma reference number.

Proforma Ref. Number : EU62002A000
Port Of Calls : 9
Voyage Days : 18

Actual Schedule Entry: Agent enters the real time of departure for the vessel. If there are changes in the schedule up to some failures or bad weather conditions; system revises vessel schedules. Cut-off times ETAs should be updated.

Terminal Cut Off Times: According to the selected Service and Proforma Reference Number; Cut Off times is entered per Ports and their Terminals. Terminal cut off times can be differentiated according to the equipment types (normal, DG, OOG) and be defined as fixed weekdays, as hours before ETA.

Vessel Assignment: Service and created Proforma reference number is selected. Date range is defined and the preferred frequency (in days) of voyages is entered. Then according to the round voyage duration calculated in proforma and the frequency days, system deploys the adequate vessel after clicking the “Deploy Vessel” button.

Proforma reference Number	: EU62002A000
Service	: Aegean / Spain
From Date	: 01.05.2005
To Date	: 31.12.2005
Frequency in days	: 18
RVD (Round Voyage Days)	:18
Deploy Vessel	: Lucien GA

At the time of vessel deployment, the denomination of voyages is formulized according to some parameters. EMES denominates the voyages starting from 207 and increases by 1 at each new voyage; and the voyage number doesn't change at turn points.

After vessel assignment is made, Operations Department can publish the vessel schedules.

Booking: Booking agencies enter bookings to the system. Each agent has a certain quota of bookings. If agency exceeds its quota, the over-bookings should go to operations department for approval.

Booking information should be converted to Plan Master Format (pml) in order to make the load planning. According to the bookings coming from different ports; loading plan is prepared. (At which ports, which containers, where to be loaded)

Agent gets the final loading plan from the port as BAPLIE format and sends it to the Operations department. Final Loading plan is converted into Plan Master and operations department sent it to the operation agency and all the ports, where the loadings will take place.

Confirmations: Confirmation requests of bookings should come to the dashboards of users at operations department related users. The requests that Operations Department can confirm are listed below.

Slot Approval: Every agencies at ports have some specific quota for bookings. If they exceed their limit the booking should be confirmed by operations department.

Agency may need extra space for forecasted bookings, so they will enter also forecasts to the system and operations department will check them not to face overbooking or missing cargo.

Over Booking: If vessel has full load of operational TEU capacity and agency enters a booking, system will send this booking to operations department for confirmation.

Cut-off Time: If cut-off time is over and a new booking is entered to the system, system will send this booking to operations department for confirmation.

DG Cargo: If a booking has a dangerous good in it, system first checks if there is any restrictions about vessel, POD country, and port. If there is any of these restrictions system will not accept booking. If there is no restriction, system will send this booking to operations department for confirmation.

System should send this booking for DG approval to operations department. Booking Number is: EMESIST0001425

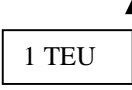


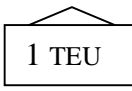



Table C.3. Booking Details

	Loading 1	Loading 2	Loading 3
Container Details			
Size	20	40	40
Type	DV	HC	OT
Rate Type	DG	Normal	OOG
Quantity	10	5	5
Void Slot			5*2=10 slots
Commodity Details			
Commodity	Cotton	TV	Construction Machinery
Rate Type	DG	Normal	OOG

Special Cargo: If there is any special cargo that can not be loaded with containers and also not break bulk, system will send this booking to operations department for confirmation.

OOG Cargo: There are five OOG containers in EMESIST00001425 booking. While preparing a booking with OOG containers, system should calculate void slots according to the “OOG Calculations Table” written below.

Table C.4. Void Slot Calculations

<i>OOG CALCULATIONS</i>					
	<i>Description</i>		<i>Void Slots</i>	<i>TOTAL</i>	<i>Chargeable TEUS for 40' Units</i>
1	20 OT O/H		1 Void Slot	2 TEUS	4 TEUS
2	20 FR O/W Each Side		4 Void Slots	5 TEUS	10 TEUS
3	20 FR O/H + O/W Each Side		5 Void Slots	6 TEUS	12 TEUS
4	20 FR O/W One Side		2 Void Slots	3 TEUS	6 TEUS
5	20 FR O/W + O/H One Side		3 Void Slots	4 TEUS	8 TEUS
6	20 FR O/L One Side		2 Void Slots	3 TEUS	6 TEUS
7	20 FR O/L Both Sides		4 Void Slots	5 TEUS	10 TEUS

Terminal Operations: At terminals Agency enters approves load and discharge plans that come from manifests and their alterations. If there is any difference they may enter reasons as remarks, and informs related agency to make manifest alterations.

- Agency also enters information about that port of call.
- Vessel Bunker details
- IFO and Gas oil Levels at Arrival and Departure
- Supplied Product
- Price
- Barging
- Water M/T
- Drafts (FWD and AFT levels) at Arrival and Departure
- Date and time of Arrival Pilot Station
- Date and time of Pilot on Board
- Date and time of Vessel Berthed

- Date and time of Start of Operation
- Tugs used in and out
- Date and time of End of Operation
- Date and time of Sail

At Valencia Port 8 shiftings are made because of UFS line's cargo. Shiftings are done by the approval. Vessel departure is delayed 2 hours at Valencia port because of UFS line's container loadings. These invoices should be prepared for UFS Line at Foreign Accounts Scenario.

A manifest alteration is prepared and approved by Trade and Operations departments before vessel arrived to Valencia port. Manifest Alteration changed the POD of one booking to Alger port. This change affects disbursement accounts. Second leg of shipment will be with North Africa Service. Second leg costs will be added to first leg by guideline rates as stated in Line Management Scenario.

Staying On Board Situation: Sometimes a container can not be discharged because of some errors. The reason of staying on board should be written on Terminal Operations Module as remarks. Responsible party of the problem is customer. EMES Operations is currently informing Foreign Accounts, Agency, and customer about situation and double freight is taken from customer. We need to see how the system will cover that problem.

Transshipment: Bookings that have transshipment ports should be filtered in the system. The process flow is at Appendices.

Automatic Transfer: After containers discharged at transshipment port system should calculate the ETA for the EMES vessel that is on the second leg. Containers should wait some days (parametric value) for customs works. This value can change according to the ports. If there is sufficient time to load, system should automatically book containers to second leg vessel.

Manuel Transfer: System should allow operations department to move bookings to second leg vessel manually.

For Other Lines' Vessels: Bookings are entered to the system by Agencies. Operations department check containers which will be loaded to other Lines' vessels on the second leg. Operations department get confirmation from the operator of other Line. The loading situation is checked via Loading Agency.

For EMES Vessels: If there is a problem at automated transfer, Operations Department should manually take containers to any other voyage

APPENDIX D. CMC SCENARIO

The main issues handled in the scenario are; port and depot contracts, container forecasting, lease agreements, on/off hire, empty and full bookings, damage and repair process, demurrage & detention, overdue containers, claim management.

Standard Ports & Depots: These ports have a regular tariff for empty storage with standard free time and rates according to date range.

Lump sum Ports & Depots: There is not any date range in this kind of ports and depots. There is a fixed amount which has been determined according to size- type of container. In some depots, this cost includes gate in – gate out cost also. In Piraeus Depot we pay only 13.50 EURO for each 20’ container and all costs are included in it. Thessalonica is other lump sum depot. We have also other lump sum ports which are Alger, Skikda, Annaba. In these ports, we pay a standard amount to agent for each discharged container and there is no cost for the movements.

Dukhelia – Alexandria Port: While we are loading to Alexandria or Dukhelia ports, empty storage tariffs changes according to status of the container.

Table D.1. Dukhelia and Alexandria Port Tariffs

	Tariffs for 20’	Tariffs for 40’
Loaded Export	6 USD / day	12 USD / day
Loaded Empty		
0-5 days	Free	Free
+2 days	3 USD /day	6 USD /day
+3 days	4 USD / day	8 USD / day
Over	6 USD / day	12 USD / day

Ocean Yard Depot: There is a standard amount that is paid annually in this depot. Besides this here is a daily control even if the quantity of EMES containers passes 50 TEUS. There is a depot charge for each passed teu which is 3 USD / TEU.

TCDD ports: TCDD port storage table is written below.

Table D.2. TCDD Port Tariffs

TYPE OF SERVICE	LENGTH OF CONTAINER	TYPE OF CONTAINER					
		Local and export CONTAINERS		IMPORT CONTAINERS		TRANSIT AND TRANSSHIPPED CONTAINERS	
		Exempt for 5 days, from 6. day				Exempt for 5 days, from 6. day	
		Incl. 6.day up to 15. day	16. day and after	Up to 15. day incl. 15. day	16. day and after	Incl. 6.day up to 20. day	21. day and after
FULL	20 FEET	7.-	12.-	9.-	15.-	4.-	7.-
	ABOVE 20 FEET	12.-	18.-	15.-	20.-	7.-	12.-
EMPTY	20 FEET	Exempt for 5 days, from 6. day				2.-	
		3.-					
	ABOVE 20 FEET	6.-				4.-	

Repair Shop Tariff at Valencia: Here are some repair items are listed for damaged units. Labor Hour is 15 USD. Material costs are in USD.

Table D.3. Repair Shop Tariffs at Spain Ports

Job code	Location	Component	Repair	Measure 1	Measure 2	Hours	Material
SRCR	Bottom	Central hat section	Replace			3	38,5
SRCS30	Bottom	Central hat section	Section	30		0,25	3,79
SRCS60	Bottom	Central hat section	Section	60		0,5	6,01
SSPR20C	Bottom	Plywood floor asmly	Replace	20'		16	688,61

SSPR40C	Bottom	Plywood floor asmlly	Replace	40'		30	1335,75
SPPR1440	Bottom	Plywood panel	Replace	120	120	3	96,72
SPPR	Bottom	Plywood panel	Replace	120	240	4	182,84
VNDM1S	Divers	Serial no&digit 1 side	Re-mark	1	SIDE	0,5	5,82
VNDM1	Divers	Marking single digit	Re-mark			0,1	0,55
PLII	Doors	Bottom rail	Insert			5	55,6
PLIS15	Doors	Bottom rail	Section	15		1	6,01
PLIS30	Doors	Bottom rail	Section	30		2	10,78
PLIS60	Doors	Bottom rail	Section	60		3,25	20,76
PLIS90	Doors	Bottom rail	Section	90		3,75	30,37
PLIS120	Doors	Bottom rail	Section	120		5	40,54
PPEG60	Doors	Corner post	Straighten	60		1,75	5,82
PPEG90	Doors	Corner post	Straighten	90		2	7,7
PDXR	Doors	Corner fitting	Replace			4	73,74
PCSR	Doors	Door compl w/o	Replace			12	354,65
PCCR	Doors	Door compl with	Replace			9	478,97
FLIR	Frontside	Bottom rail	Replace			7	80,39
FLII	Frontside	Bottom rail	Insert			4,75	55,6
FLIS120	Frontside	Bottom rail	Section	120		5	40,54
ITXR	Internal	Lashing device	Replace			0,25	0,92
IPLR	Internal	Plywood lining	Replace			1,5	24,27
TPPRA	Roof	Flat steel panel addit	Replace			4	104,08
TPXG	Roof	Panel asmlly	Straighten			3	8,22
TBXG	Roof	Roof bow	Straighten			0,75	1,63
TBXGA	Roof	Roof bow addit	Straighten			0,5	1,63
LLIR20C	Sidewalls	Bottom rail	Replace	20'		20	156,57
LLIR40C	Sidewalls	Bottom rail	Replace	40'		38	289,48
LLIS15	Sidewalls	Bottom rail	Section	15		1	6,01
LLIS30	Sidewalls	Bottom rail	Section	30		2	10,78
LLIS60	Sidewalls	Bottom rail	Section	60		3,25	20,76
LLIS90	Sidewalls	Bottom rail	Section	90		3,75	30,37
LLIS120	Sidewalls	Bottom rail	Section	120		5	40,54
LLIS180	Sidewalls	Bottom rail	Section	180		6,5	60,87
UVTRC	Underside	Crossmember	Replace	C120		3	27,57
UVTRCA	Underside	Crossmember adit	Replace	C120		2	27,57
UVTRI	Underside	Crossmember	Replace	I120		3	32,4
UVTRIA	Underside	Crossmember adit	Replace	I120		2	32,4
UVTI15	Underside	Crossmember	Insert	15		1	4,93

UCVR	Underside	Rail gusset	Replace			1	7,39
UCVG	Underside	Rail gusset	Straighten			0,25	0,68
UCVW	Underside	Rail gusset	Weld			0,25	1,72

Container Forecasting: Agency sends the forecast report. After departure of each vessel, EMES checks this report taking the balance status into consideration. Loading for the first vessel must be equal to sum of following three items

- Full export containers that returned to port
- Empty containers sent to the customer for the first vessel
- Empty stock

Import full containers at port or at customer and import full containers on board should affect the balance if the containers are ready to use. Turn time calculations show whether these containers are ready to use or not. Turn times should be updated.

Table D.4. Forecast for 22.05.2005 at VALENCIA Port MV Rouse 203 / 05

	20 DV	20 OT	40 DV	40 OT	40 HC
Estimated Total Booking	15	10	5	20	15
Empty Available	8	10	5	10	5
Expected to be Empty	2			10	10
Balance	- 5	0	0	0	0

Table D.5. Forecast for 01.05.2005 at ISTANBUL Port Lucien G.A 207 / 05

	20 DV	20 OT	40 DV	40 OT	40 HC
Demand for Export Loading	25	15	15	30	20
Empty Available	15	5	10	15	10
Expected to be empty		10	5	10	5
Balance	- 10	0	0	- 5	- 5

To get the lack of equipment for the booking of vessel Lucien G.A 207/05; the below criteria should be considered;

- Will the full import containers be emptied on time for the loading?
- Is empty repositioning with another vessel is possible?
- Is there a facility for empty repositioning by our vessels?
- By one positioning
- By two positioning
- Positioning by third party vessel
- If there's not a freight / slot agreement trade department will be informed and if freight is approved then empty repositioning realizes.
- If empty repositioning is not enough for the load demands, Lease from either other lines or container leasing companies will be done.

Cost evaluation: Select the lease company, considering leased containers in the general stock and their turnover restrictions & balance. The details about getting the containers will be obtained from the leasing company/line(location, amount) Agreement with Lease company and gives Agency an approval to pick up leased containers.

On-Hire: According to the information taken from booking; the below containers are needed as empty.

Table D.6. Container Numbers That Will Be Leased From Companies

Quantity Needed	Size	Type	Leasing Company
10	20	DV	CAI
5	40	HC	INTERPOOL
5	40	OT	LISKI

Lease Containers from CAI

CMC department decides to get the containers from CAI and makes a Cabotage Agreement with CAI. When a container is leased, EMES informs the agency about the usage restrictions. The agreement includes the following items.

Agreement

There's a handling cost of 35 USD to be paid by pick-ups and turnovers.

In addition to this, EMES has a special agreement with CAI. The details of this agreement are written below.

When EMES uses CAI containers, which have time problems, EMES will pay the handling in/out in İzmir depot and CAI won't ask for the 35 USD handling from EMES.

1*20DV from CAI as one way cabotage; in addition to the CAI contract, a special contract is made with CAI. According to this contract; the container should be dropped off in Valencia.

- Restriction 1 : Containers can only be used for loadings to Valencia.
- Restriction 2 : When the containers are discharged, they should be sent to CAI stock.
- Restriction 3 : There is 30 days free time to drop to CAI Depot, if free time is exceeded 0,75 USD is charged per day.
-

Table D.7. Leased Container Numbers from CAI

Container Number	Size	Type
ARKU 200053/0	20	DV
ARKU 220013/8	20	DV
ARKU 220029/3	20	DV
ARKU 400026/8	20	DV
ARKU 400038/1	20	DV
ARKU 420013/7	20	DV
ARKU 820250/2	20	DV
ARKU 830006/8	20	DV
ARKU 830195/3	20	DV
ARKU 120001/0	20	DV

The containers will be picked up from CAI depot, which is in Ankara. They will be carried to İstanbul depot by truck & train ways. The pre carriage costs are like below:

Table D.8. Pre-Carriage Costs

Pre-carriage (Ankara - Istanbul)	
Trucking	250 USD / CNTR
Railway	250 USD / CNTR

When the containers come to İstanbul depot; Agency makes “Send to Shipper” movement in the system for stuffing.

Lease- Purchase from INTERPOOL: CMC department makes a Lease-Purchase Agreement with Interpool. The agreement includes the following items.

Agreement

Paying period takes 5-8 years. If EMES gets new series of containers from ports; which are specified in agreement, then EMES gets drop-off cost. This is applied at ports where pick-up causes cost for EMES. Pick-up cost from Interpool-Istanbul depot is 15 USD per 40 DV containers. This amount will be paid to EMES by Interpool. Daily Rate: 0,87 USD paid for 5 years.

Table D.9. Leased Containers from Interpool

Container Number	Size	Type
ARKU 600001/4	40	HC
ARKU 600002/0	40	HC
ARKU 600003/5	40	HC
ARKU 900001/8	40	HC
ARKU 900002/3	40	HC

After picking up from depot, CMC sends the containers to the shipper for stuffing.

Lease Containers from LISKI: Empty container demand on 5*40 OT. CMC department makes a Lease Agreement with LISKI. The agreement includes the following items

Agreement

Leasing starts when a container is discharged at the port. If the container enters to EMES' stock for the first time, EMES pays a charge for the turnover. This charge is called "Preparation Cost". If EMES takes this container for the second time, then there's no "Preparation Cost". But if the container had maintenance and EMES takes this container for more than once, EMES has to pay preparation cost again.

- Daily Rates: 2.5 USD per 20'
- Daily Rates: 3.5 USD per 40'
- The preparation cost is 70 USD per 40' and 50 USD per 20'

Table D.10. Containers Leased from Liski

Container Number	Size	Type
ARKU 120002/5	40	OT
ARKU 120003/0	40	OT
ARKU 320001/9	40	OT
ARKU 320002/4	40	OT
ARKU 320003/0	40	OT

After picking up from depot, CMC sends the containers to the shipper for stuffing.

Repositioning: According to the forecast report sent by the agency in Valencia, CMC decides to reposition 5*20 HC from Istanbul to Valencia. Below containers will be picked up from Istanbul depot according to FIFO rule.

Table D.11. Containers that will be taken from Istanbul depot

Container Number	Size	Type
ARKU 320002 5	20	HC
ARKU 320003 1	20	HC
ARKU 820001 9	20	HC
ARKU 820002 2	20	HC
ARKU 820003 5	20	HC

These containers will be carried to the Istanbul Port on truck. (75 USD per Container)

Empty Booking for Reposition: Empty containers in Istanbul depot have been taken and sent to Valencia for repositioning purposes.

Table D.12. Empty Booked Containers

Container Number	Size	Type
ARKU 320002 5	20	HC
ARKU 320003 1	20	HC
ARKU 820001 9	20	HC
ARKU 820002 2	20	HC
ARKU 820003 5	20	HC

There are three options if the empty containers are not loaded to vessel;

- An urgent export cargo is loaded to vessel by Agency with the confirmations of Operations and Trade Department. Trade department and CMC department calculate the loss and debit it to agency.
- Container may be damaged, responsible party is determined and loss debited.
- A problem may occur because of Agency or any other third party, responsible party is determined and loss debited.

All problems about loading should be recorded in the system. There should be a report that CMC can follow how many containers could not be loaded to a vessel because of

- Insufficient space at vessel (This value is used for increasing capacity of vessel)
- Agency Mistake
- Damage

Full Booking: Containers that have attached to a booking number (EMESIST0001425) at Booking scenario:

There are 10 pieces 20 DV, 5 pieces 40 DV, 5 pieces 40 OT. These containers will be shipped to Valencia port.

Container Numbers attached to this booking:

Table D.13. Container Numbers from Booking Scenario

Container Number	Size	Type	Container Number	Size	Type
ARKU 200053/0	20	DV	ARKU 120002/5	40	OT
ARKU 220013/8	20	DV	ARKU 120003/0	40	OT
ARKU 220029/3	20	DV	ARKU 320001/9	40	OT
ARKU 400026/8	20	DV	ARKU 320002/4	40	OT
ARKU 400038/1	20	DV	ARKU 320003/0	40	OT
ARKU 420013/7	20	DV	ARKU 600001/4	40	HC
ARKU 820250/2	20	DV	ARKU 600002/0	40	HC
ARKU 830006/8	20	DV	ARKU 600003/5	40	HC
ARKU 830195/3	20	DV	ARKU 900001/8	40	HC
ARKU 120001/0	20	DV	ARKU 900002/3	40	HC

Damage-Repair Process: At Valencia Port ARKU 220013/8 is damaged while it is full. Container would not be loaded to vessel. So it is unstuffed. The commodity is damaged, Claim Management process begins. A survey is made and B/ L and damage that informed by Agency are compared. Commodity, type, amount are compared. B/L, interchange report is sent to advocate and P&I.

Valencia Agency informs CMC that ARKU 220013/8 is damaged. Agency changes container status to Damaged and sends EIR's to CMC. CMC evaluates and determines responsible party. CMC informs Foreign Accounts about debiting. Agency sends

container to Terminal depot. Surveyor prepares repair estimate, Agency enters estimate to the system. CMC evaluates estimate and approves required items.

The estimate includes these

Table D.14. Damage Estimate Items

Location	Component	Repair	Measure 1	Measure 2	Hours	Material
Internal	Lashing device	Replace			0,25	0,92
Doors	Door Compl With	Replace			9	478,97
Sidewalls	Bottom rail	Replace	20'		20	156,57

The containers written below are waited for 5 days after free time of Valencia port is over. Detentions should be debited to customer.

Table D.15. Containers that has detention

Container Number	Size	Type
ARKU 120002/5	40	OT
ARKU 120003/0	40	OT
ARKU 320001/9	40	OT

The container written below is waited at port for 35 days, so container changed to overdue status by system. Notifications to responsible party about overdue are sent by the system.

Table D.16. Number of Overdue Container

Container Number	Size	Type
ARKU 320002/4	40	OT

The containers written below are waited at customer for 20 days. Slabs for Valencia are given below:

Table D.17. Demurrage Time Slabs at Spain Ports

1-7 days	8-15 days	16-30 days	30-9999 days
Free	5 USD	7 USD	8 USD

Table D.18. Containers that have Demurrage

Container Number	Size	Type
ARKU 220029/3	20	DV
ARKU 400026/8	20	DV
ARKU 400038/1	20	DV
ARKU 420013/7	20	DV
ARKU 820250/2	20	DV
ARKU 830006/8	20	DV

System should calculate demurrages for the customer.

APPENDIX E. LINE MANAGEMENT SCENARIO

In this scenario, there will be two phases, one phase for liner profitability statement and slot rate, other phase for partner vessel feeder profitability and liner profitability.

Liner Vessel Profitability and Slot Rates

Table E.1. Voyage dDtails

Service	Aegean / Spain
Operator	EMES
Vessel	Lucien G A
Voyage	207 / 5
Start Date	01.05.2005 15:00
End Date	19.05.2005 09:00
Ports	Valencia – Barcelona – Piraeus – Thessalonica – Marport - Haydarpaşa – İzmir – Tunis - Valencia

Table E.2. Vessel Setup Daily Rate Details for Lucien G A

Hire	15000 USD
Representation	23.33
Communication	20
Lashing Bonus	16.66
Insurance (P&I)	20
Etc..	Other items can be added

There must be some optional fields that some vessel related costs can be entered per day basis. In the off-hire periods of vessel expenses will not be calculated.

Bunker Details: Bunker information will come from the terminal operations module.

Table E.3. Bunker Details of Lucien G A

Port	Start		Refueling		End	Consumption	W. Av.	Total
	M /Tons	Price	M /Tons	Price	M /Tons	M /Tons	Price	US \$
Fuel oil								
Valencia	393,50	200,05			379,50	14,00	200,05	2800,70
Barcelona	379,50	200,05			290,90	88,60	200,05	17724,43
Piraeus	290,90	200,05	350,00	237,00	617,70	23,20	220,23	5109,30
Saloniki	617,70	220,23			589,30	28,40	220,23	6254,49
Marport	589,30	220,23			586,80	2,50	220,23	550,57
Haydarpasa	586,80	220,23			565,30	21,50	220,23	4734,92

Izmir	565,30	220,23			476,60	88,70	220,23	19534,28
Tunis	476,60	220,23			418,40	58,20	220,23	12817,31
Valencia	418,40	220,23			0,00	0,00	0,00	0,00
Total			350,000	237,00		325,100		69526,01
Average price								213,86
Diesel oil								
Valencia	39,30	443,06			37,10	2,20	443,06	974,73
Barcelona	37,10	443,06			34,80	2,30	443,06	1019,04
Piraeus	34,80	443,06	40,09	469	69,50	5,39	456,95	2462,94
Saloniki	69,50	456,95			66,80	2,70	456,95	1233,75
Marport	66,80	456,95			59,00	7,80	456,95	3564,18
Haydarpasa	59,00	456,95			56,30	2,70	456,95	1233,75
Izmir	56,30	456,95			54,30	2,00	456,95	913,89
Tunis	54,30	456,95			49,70	4,60	456,95	2101,95
Valencia	49,70	456,95			49,70	0,00	456,95	0,00
Total			40,09	469		29,69		13.504,24
Average price								454,84

Port Expenses Provisional Costs: Agency enters the provisional port expenses and when they are realized the actual amount will be calculated according to the port contracts. Port expenses will be entered in terminal operations module. Port agreements are listed in Appendices

Other Costs: The cost written here will come from Vessel daily charges like hire, communication, representation etc. There will be also voyage related costs like shiftings, surveys etc should be entered from Terminal Operations.

If costs occur because of another liner, it should not be added to costs of this voyage. E.g. Shifting occur for the need of MCL, this cost must be invoiced to MCL, not calculated in Profitability Statement.

There may be some costs related to call to a specific port like ITGIT, there is a cost for a period for a vessel, this cost should be applied partially to the voyage.

Container Handling Fee in Spain: In Spain ports EMES pays for Terminal Handling Costs then Agency pays EMES these costs. These THC will be entered to system from Terminal Operations.

Transportation Costs: If a container is shipped to a transshipment port, all second leg costs will be added to first leg by guideline rates.

Slot Agreements: In scenario MCL and ZIM have slots on EMES Vessel. Details are written below:

Table E.4. MCL Slots

Feeder	P.o.l.	P.o.d.	Ttl 20*	Ttl 40*	Teu	Extra	Wb	Teu	Usd	
Feeder	P.o.l.	P.o.d.	20'ttl	40'ttl	Ttl	Slot	Lumpsum	150	275	41250
Mcl		Valencia	20	17	54	0	Wb	Extra teu	Usd	
Ufs		Valencia	4	9	22	0	187	37	150	5550
Mcl		Barcelona	14	39	92	0	Eb	Extra teu	Usd	
Ufs		Barcelona	11	4	19	0	242	92	290	26680
	Total westbound		49	69	187	37	Eb	Teu	Usd	
							Lumpsum	150	275	41250
Feeder	P.o.l.	P.o.d.	20'ttl	40'ttl	Teu		Reefer	2	100	200
Mcl	Valencia		40	49	138	0	Imco	2	50	100
Ufs	Valencia		0	0	0	0			Total	115030
Mcl	Barcelona		4	50	104	0				
Ufs	Barcelona		0	0	0	0				
	Total eastbound		44	99	242	92				
		Mcl	78	155	388					
		Ufs	15	13	41					
		Ttl	93	168	429	129	Ttl extra slots			

EMES-MCL Slot Agreement:

- 150 minimum @ Usd 400/Slot. Slots in round voyage at 15 mts.hom. excluding Aegean Ports
- Aegean interports : Usd 120/teu full-Usd 50/teu empty
- Excess over 150 slots: Usd 200/teu full-Usd 100/teu empty fios in both direction
- (Excess on board will only apply sailing last port in Spain and sailing last port in Aegean)
- Reefer surcharge:Usd 100/box
- Imo surcharge:Usd 50/box

Table E.5. ZIM Slots

Line	P.o.l.	P.o.d.	Ttl 20*	Ttl 40*	Teu	Extra	Wb	Teu	Usd	
Line	P.o.l.	P.o.d.	20'ttl	40'ttl	Ttl	Slot	Lumpsum	85	225	19125
Zim		Valencia	0	0	0	0	Wb	Ton		
Zim		Barcelona	76	0	76	0	76	1	1719577	225
Zim	Valencia		0	0	0	0	Eb	TOn		
Zim	Barcelona		0	0	0	0	0	0	0	0
		Total	76	0	76	86	Eb	Teu	Usd	
							Izm.cong. Surch	69	35	2415
		To spain	76	0			Reefer		100	0
		From spain	0	0			Imco		50	0
									Total	21765

EMES-ZIM Slot Agreement

- USD.225 per Teu/20 tons Kpx+Ist+Izm/Barcelona Free-IN-OUT for full containers but anyhow not less than total 85teu*225=USD.19125 per vessel
- For additional quantity permitted to load over 85 Teu or 1700 tons, whichever reached first, USD.225/teu additional will be charged regardless the weight per Teu
- USD.100 per TEU Marport+Ist/Izmir Free-IN/OUT for empty containers
- USD.160 per TEU Marport+Ist/Izmir Free-IN/OUT for full containers regardless the weight.
- Izmir congestion surcharge: USD 35/teu
- There may be 2 types of Slot agreements:
- Port to port and usage basis: Line can use a special rate for a port pair on a used slot basis.
-

On board slot basis: Line can use agreed number of slots with fixed rate and will be invoiced weather used or not used. If allocation exceeded by Line different rate will be applied.

Feeder Vessel Profitability and Liner Profitability

If EMES is in a partnership, a vessel operated by one Line, there must be prepared by one line and controlled by others. Operator Line sends all details like Vessel, voyage,

bunker, port expenses that are discussed above. While preparing a Feeder PS all freights and cost must be entered to system because system will not have any data for this voyage, only EMES COC container bookings details will be retrieved from system.

Liner Bookings

Table E.6. Liner Bookings

P.o.l.	P.o.d.	20'			40'				Teu	Freight
P.o.l.	P.o.d.	Box	Ot	20'ttl	Box	Ot	Hc	40'ttl	Ttl	
Piraeus	Valencia	1		1	6		2	8	17	1451,38
Piraeus	Tunis			0			14	14	28	11760,00
Piraeus	Haydarpasa			0	2			2	4	330,00
Salonica	Marport	7		7				0	7	910,00
Salonica	Valencia	10		10			4	4	18	2180,69
Salonica	Barcelona	1		1				0	1	147,51
Salonica	Tunis	5		5	1			1	7	4400,00
Marport	Valencia	3		3	2		12	14	31	8075,05
Marport	Barcelona	1	1	2			2	2	6	1975,64
Marport	Tunis	18		18	10		6	16	50	30517,68
Izmir	Valencia	30	7	37	52		35	87	211	60082,30
Izmir	Barcelona	56	2	58	12			12	82	26148,96
Izmir	Tunis	9		9	36		2	38	85	51047,20
Haydarpasa	Valencia	5		5	5		1	6	17	4425,72
Haydarpasa	Barcelona	3		3	2		3	5	13	4342,10
Valencia	Piraeus	33		33	8		24	32	97	42763,71
Valencia	Salonica	72		72	8		19	27	126	56082,70
Valencia	Marport	1		1	7		6	13	27	11049,99
Valencia	Izmir	3		3	2			2	7	3961,64
Valencia	Haydarpasa	1		1	2			2	5	2227,15
Barcelona	Piraeus	7		7	14		12	26	59	26976,73
Barcelona	Salonica	12		12	3		4	7	26	11625,43
Barcelona	Marport	13		13	12		4	16	45	28569,63
Barcelona	Izmir	10		10	30		14	44	98	46565,06
Barcelona	Haydarpasa	18		18	3		4	7	32	16010,40
Tunis	Haydarpasa	1		1	4			4	9	2700,00
Tunis	Valencia			0	1			1	2	400,00
Total		320	10	330	222	0	168	390	1110	456726,7
Empties										
P.o.l.	P.o.d.	20'			40'				Teu	Freight
P.o.l.	P.o.d.	Box	Ot	20*ttl	Box	Ot	Hc	40*ttl	Ttl	
Piraeus	Marport	12		12	18		29	47	106	0
Piraeus	Izmir	73		73				0	73	0
Salonica	Izmir	20		20			10	10	40	0
Haydarpasa	Barcelona	1		1				0	1	330

Valencia	Barcelona			0	2		12	14	28	0
Valencia	Marport			0			4	4	8	0
Total		106	0	106	20	0	55	75	256	330

Table E.7. Transit Liner Bookings

P.o.l.	T/s port	P.o.d.	20'			40'				Ttl	Teu	Freight
			Box	Ot	Ttl	Box	Ot	Hc	Ttl	Cntrs	Ttl	
Valencia	Marport	Constantza	19		19				0	19	19	10887
Valencia	Marport	Novorossisk	1		1				0	1	1	778
Valencia	Marport	Gemlik	1		1				0	1	1	637
Saloniki	Marport	Odessa		1	1				0	1	1	1845
Saloniki	Marport	Novorossisk	13		13				0	13	13	5750
Blacksea	Marport	Valencia	1		1				0	1	1	150
Total			35	1	36	0	0	0	0	36	36	20047,3

Table E.8. Transit Full Feeder Bookings

FEEDER	P.O.L.	P.O.D.	20B	20OT	TTL	40B	40OT	40HC	TTL	TEU	Freight
FEEDER	P.O.L.	P.O.D.	20B	20OT	20'TTL	40B	40OT	40HC	40'TTL	TTL	
MCL	Valencia	Piraeus	2	2	4			1	1	6	0
MCL	Valencia	Salonica			0			10	10	20	0
MCL	Valencia	Haydarpassa			0	2			2	4	0
MCL	Valencia	Marport			0	7			7	14	0
MCL	Valencia	Piraeus			0	1			1	2	0
MCL	Valencia	Marport	1		1				0	1	0
MCL	Valencia	Haydarpassa	30		30				0	30	0
MCL	Valencia	Marport			0	1			1	2	0
MCL	Valencia	Marport	2		2				0	2	0
MCL	Valencia	Izmir			0	20			20	40	0
MCL	Valencia	Piraeus	1		1				0	1	0
MCL	Valencia	Salonica	1		1			1	1	3	0
MCL	Valencia	Salonica	1		1				0	1	0
MCL	Valencia	Haydarpassa			0			3	3	6	0
MCL	Valencia	Izmir			0			3	3	6	0
EMES	Valencia	Izmir	2		2	5			5	12	4260
EMES	Valencia	Izmir	1		1				0	1	285
EMES	Valencia	Haydarpassa			0	3			3	6	5800
EMES	Valencia	Salonica			0	2			2	4	
EMES	Barcelona	Haydarpassa			0	1			1	2	
EMES	Barcelona	Izmir			0	2			2	4	1140
EMES	Barcelona	Izmir	1		1				0	1	355
MCL	Barcelona	Piraeus	1		1	17			17	35	0
MCL	Barcelona	Salonica			0	19			19	38	0
MCL	Barcelona	Haydarpassa	1		1				0	1	0
MCL	Barcelona	Salonica	1		1				0	1	0
MCL	Barcelona	Marport			0	1			1	2	0
MCL	Barcelona	Haydarpassa			0	4			4	8	0
MCL	Barcelona	Marport			0	1			1	2	0

MCL	Barcelona	Piraeus	1		1	8			8	17	0
MCL	Piraeus	Valencia	1		1	1			1	3	0
MCL	Piraeus	Valencia	1		1				0	1	0
UFS	Piraeus	Izmir	1		1				0	1	160
MCL	Salonica	Barcelona	12		12			9	9	30	0
MCL	Salonica	Valencia	2		2			3	3	8	0
MCL	Salonica	Valencia			0	1			1	2	0
UFS	Salonica	Valencia			0			2	2	4	0
MCL	Marport	Barcelona	1		1				0	1	0
MCL	Marport	Barcelona			0	3		2	5	10	0
EMES	Marport	Barcelona	1		1				0	1	5800
EMES	Marport	Barcelona	5		5				0	5	0
MCL	Marport	Valencia			0			1	1	2	0
MCL	Marport	Valencia	1		1			1	1	3	0
EMES	Haydarpasa	Barcelona	2		2				0	2	0
MCL	Haydarpasa	Barcelona	1		1				0	1	0
MCL	Haydarpasa	Valencia	4		4				0	4	0
MCL	Haydarpasa	Valencia			0	1			1	2	0
MCL	Izmir	Valencia			0	1			1	2	0
EMES	Izmir	Valencia	1		1				0	1	350
UFS	Izmir	Barcelona	2		2	1		3	4	10	0
UFS	Izmir	Valencia			0			1	1	2	0
EMES	Izmir	Valencia	4		4				0	4	
MCL	Izmir	Valencia			0			1	1	2	0
UFS	Izmir	Barcelona	9		9				0	9	0
UFS	Izmir	Valencia	3		3				0	3	0
UFS	Izmir	Valencia	1		1	5		1	6	13	0
MCL	Izmir	Valencia	2		2			4	4	10	0
EMES	Izmir	Barcelona	69		69				0	69	0
FULL TOTAL			169	2	171	107	0	46	153	477	18150

Table E.9. Empty Bookings

Feeder	P.o.l.	P.o.d.	20box	20ot	Ttl	40box	40ot	40hc	Ttl	Teu	Freight
	P.o.l.	P.o.d.	20box	20ot	20*ttl	40box	40ot	40hc	40*ttl	Ttl	
EMES	Barcelona	Salonica			0	42			42	84	13440
MCL	Piraeus	Valencia		9	9			3	3	15	0
MCL	Marport	Barcelona			0	20			20	40	0
MCL	Haydarpasa	Barcelona			0	5			5	10	0
EMES	Haydarpasa	Izmir	160		160				0	160	17600
EMES	Haydarpasa	Izmir	100		100				0	100	10000
EMES	Haydarpasa	Izmir			0			1	1	2	130
EMPTY	TOTAL		260	9	269	67	0	4	71	411	41170

Agency Contracts

Turkish Agencies

- Inward Freight Commission: 5 USD /TEU
- Outward Freight Commission: 24 USD /TEU

Greek Agencies

- Inward Freight Commission: 15 USD /TEU
- Outward Freight Commission: 25 USD /TEU
- Principle shall remit to the agent 700 USD of Husbandry fee per vessel call
- Agency will receive 10 % of Demurrages collected and transferred to the principles

Tunis Agency

- Inward Freight Commission: 3 % of Sea Freight
- Outward Freight Commission: 6 % of Sea Freight
- SOC: 8 USD / Full Box
- SOC: 2 USD / Empty Box
- When the agent acts as the vessel agent agency fee: 600 USD / call (only applicable aggregation of the remuneration resulting from points above not reaching 600 USD)
- Taxi expenses when the agent acts as a vessel agent 100 USD / call
- Container handling fee: 5 USD /box
- Broker's fee when the agent acts as a vessel agent 100 USD / call
- Agency will receive 5% of Demurrages collected and transferred to the principles

Spain Agencies

- Inward Freight Commission: 3,5 % of Sea Freight (This commission amount cannot be less than 5 USD / container)
- Outward Freight Commission: 7 % of Sea Freight
- SOC: 8 USD / Full Box
- SOC: 2 USD / Empty Box

- When the agent acts as the vessel agent agency fee: 600 USD / call (only applicable aggregation of the remuneration resulting from points above not reaching 600 USD)
- Taxi expenses when the agent acts as a vessel agent 100 USD / call
- Container handling fee: 5 USD /box
- Courier's expenses: one DHL envelop per vessel for each destination port (Piraeus, Thessalonica, Izmir, Istanbul) from Barcelona and Valencia will be financed by EMES.
- Broker's fee when the agent acts as a vessel agent 100 USD / call
- Agency will receive 5% of Demurrages collected and transferred to the principles.
- No FAC will be paid by the Line.

Terminal Handling Rates

Table E.10. Terminal Handling Rates

	PORT	20'	40'	CURRENCY	FULL/ EMPTY
FREE IN / OUT	BARCELONA	75,16	88,30	EURO	FULL
GATE IN / OUT	BARCELONA	26,28	31,24	EURO	FULL
FREE IN / OUT	BARCELONA	52,56	63,07	EURO	EMPTY
GATE IN / OUT	BARCELONA	24,18	26,28	EURO	EMPTY
DEPOT	BARCELONA	22,84	30,66	EURO	FULL
FREE IN / OUT	VALENCIA	48,95	61,64	EURO	FULL
GATE IN / OUT	VALENCIA	27,45	30,98	EURO	FULL
FREE IN / OUT	VALENCIA	43,96	54,18	EURO	EMPTY
GATE IN / OUT	VALENCIA	20,13	26,20	EURO	EMPTY
DEPOT	VALENCIA	22,84	30,66	EURO	FULL
FREE IN / OUT	PIRE AUS	52,82	58,69	EURO	EMPTY
FREE IN / OUT	THESALONICA	48,16	68,81	EURO	EMPTY
FREE IN / OUT	TUNIS	30	30	EURO	EMPTY
THC	ISTANBUL	20	20	USD	EMPTY
THC	IZMIR	40	40	USD	EMPTY
THC	HAYDARPASA	40	40	USD	EMPTY

APPENDIX F. DISBURSEMENT ACCOUNTS SCENARIO

Preparation of the Vessel and Cargo Expenses

Loading Agency enters the terminal arrival and departure operations (TDR) data through Terminal Operations Module into the system. Loading List and Manifest come from bookings that are converted to BL. If there's a Manifest alteration like freight cost, container type size correction, this has also to be informed to the Disbursement Accounts. Vessel Sailing Schedule is prepared by Operations department and published, so DA department can see from VSS Module. Freight invoices can be created from BL's which are ready in the system.

Liner Shipments: For the liner shipment, bills will be prepared due to the sum of all the issues in the manifest. If there is a manifest alteration, before agency invoice is printed, system should revise the related items in agents invoice. If there is a manifest alteration after agency invoice is printed, agency should send an invoice for the excess amount or Disbursement accounts department should prepare an additional invoice (debit or credit the difference up to the in the invoice). All invoices and credit notes must be reported to the relevant statement of each agency or third party.

If there occurs any shifting because of another liner or a customer, system should keep the track of responsible party. Invoice about shifting and anything that causes the delay of vessel departure should be produced by the system.

Feeder Shipments: If it is a feeder shipment, and there's an EMES partnership, then Profitability Statements (Black Sea- North Africa - Spain Services) will be entered to the system. Profitability Statement check will be made about the cargos which are carried on EMES slots. This control will be made on port and freight and line basis. If EMES is the operator of the vessel, after checking all the items in the voyage; the final profit/loss will be invoiced to the partners. If the operator is not EMES, the bills will come from the partners and then checking will be made.

If it is a feeder shipment and there's not an EMES partnership, then billing will be made to the ship-owner company whose slot is used for this shipment. To show the account status, SOA is prepared and sent to the related ship-owner company.

If there is not any "feeder rate" for some specific ports, system should not allow agency to book cargo of other lines. The agency has to trigger Trade Department for the rates in order to create the bookings in the system.

In feeder operations with partnership vessel operated by EMES;

a-) If we are loading (carrying) our cargo, manifest should be in liner rates

b-) If we are loading (carrying) other liner's cargo, they should be cargo manifested ie monetary terms will not appear on the agency side. However, the system should keep track of all shipments by feeder rates for invoicing to other lines.

Vessel Hire Invoices: System should calculate the amount of vessel hires to be invoiced in these two cases:

a-) we hire a vessel and operate it.

b-) we hire a vessel and sublet it to other companies.

Controlling Disbursement Accounts

Agency enters all the vessel and cargo expenses such as port costs, cargo costs, owner expenses etc. into the system.

Disbursement Accounts department takes the report for agent's disbursement details and checks these amounts with the port tariffs which are already in the system. If there is an expense whereas its' actual amount is not known by the agency, agency is obliged to enter a provisional amount to the system. When the invoice (receipt) is held then the agency will revise or correct the provisional data to the actual amount. DA department will approve an invoice to the accounting department once the actual amount is entered.

Expenses related with empty container movements such as depot storage, gate in, gate out or depot in-out etc. are calculated in the system. Incoming invoices about these containers are cross-checked with the costs prepared in the system.

DA department has to be able to settle the invoice in different currencies. Company currency conversion rates should be in daily basis.

Invoice due dates should be calculated from a predefined activity date. If a customer has special credit days more than the normal due days, then the manifest will be invoiced according to this special due days. Commodity based credit days should be available in the system.

For exceptional customers, manifest invoices should be directly printed to the customer instead of agent. (Gross Remittance System)

By entering the invoice details to the system accounting department prints the invoice. Disbursement Accounts department take two copies of the invoice. Invoice amount is added to the relevant account of the agency.

Invoices are sent to the agency with extract of account. Agency controls the amounts and makes reconciliation with Disbursement Account Department. Money is transferred to or requested from Agency according to the extract of account.

Demurrage and Repair Invoice Controls: System calculates demurrage invoices at depots and terminals according to tariffs. CMC department send the demurrage list to the agency and DA department. The list includes demurrage amounts for container numbers at depots or terminals. DA department invoice the demurrage amount to the agency.

When a container is damaged Agency enters repair estimate to the system. Then Agency requests repair authorization from CMC department with estimates. CMC controls estimates and decides items to be repaired in the estimate. Then CMC authorize the container repair request and repair amount in the system. Agency sends the invoice to DA department and DA department cross-check the amount with the confirmed amount

From CMC Scenario: System should calculate incoming invoices in order to control with original ones. Below are containers that are used in CMC scenario that have invoices.

ARKU 2000530 - Repair

ARKU 2200138 - Empty Storage

ARKU 2200293 - Trucking from Depot to Terminal

ARKU 4000268 - Demurrage

ARKU 4000381 - Leased container pick up and drop off costs from contracts⁴

On the other hand system should calculate all costs related with empty containers, costs at terminals, depots, trucks etc.

From Quotation and Booking Scenario: System should calculate freight invoices to print. Booking number in “Quotation and Booking Scenario” is EMESIST0001425.

From Operations Scenario: There occur 5 shiftings for 20DV Box for UFS Liner Company at Marport Terminal. Also there is a delay because of UFS Line. This information is coming from Terminal Operations Module in Operations scenario. System is supposed to calculate invoices to be printed for UFS Line.

From Line Management Scenario: System should calculate agency freight commissions from agency contract which is in Line Management Scenario.

System should calculate hire costs of Lucien G.A. System should check incoming invoices from depot, terminal etc. by the tariffs in the system. Agency may update costs after receiving some receipts, so system should change extract of account after change is approved.

Slot selling invoices should be prepared and buying invoices should be controlled in the system.

⁴ This container is picked up from CAI, and related contract information is in Appendices 7.1

APPENDIX G. DEMONSTRATION RFI QUESTIONS

These questions are answered by Emes project team individually during demonstrations.

F: Functional Need

R: Report Need

N/A: Not Available

M/N: Modification Needed (Need to make change on database also)

C/N: Customization Needed (Minor changes)

A: Available

Table G.1. Demonstration RFI Questions

Functional Or Report	QUESTIONS
	CONTAINER MOVEMENT CONTROL
F	System inputs (as mentioned in the “Container Movement Control” scenario) are available.
F	EMES CMC is informed directly about the approved free time.
F	Agreements about “Free time extension “can be traced in the system according to selected customer.
F	System provides entries for Detention / Demurrage rates.
F	When customer exceeds the predetermined free time, system alerts the EMES and agent user about the situation.
F	System supports the “Cabotage agreements “and “One way agreements.”
F	System supports routing rules for containers (like prohibiting some containers to go to a certain port.)
F	Information about Lease Agreements (Rates) is provided.
F	FIFO performance evaluation of the agents(per port) can be followed.
F	Damage should be entered with the related damage codes. (By the agent)
F	In the system there’s an “Approve/Deny” option about the damage. (Damage Repair Approval by EMES CMC)

F	System supports the communication with the agents per EDI.(Approval will be done on the program and be sent to the agent per EDI)
F	Depot or repair shop properties can be seen in the system according to the related containers.
F	Repair costs and empty/full container costs (for depots) can be followed.
F	Container status is available in the system.(damaged, available)
R	Container movements can be followed for given time intervals and related reports can be retrieved from the system in detail.
R	System provides statistical information about the containers (empty/full/in depot/repair shop) for given locations for a certain time period.
F	Historical data for containers is achievable.(Including details like cost, repair made)
R	Turn Time Analysis Report per port is available.
F	System has tools to support forecasting for the future empty equipment positioning.
F	Rates of all ports and depot (warehouses prices for MTY,EXP,IMP, gate in/out, discharge(empty and full)
F	Land transport tariffs (train and truck)
R	Average calculation for ports for a given period of time
F	Current stock cost calculation for a given port
R	Cost Balance for hired containers per day/month by company
R	Profit Balance for rented containers per day/month by company
R	Commodity type rate transported port to port
F	Listing of free time extension codes and free times by port(extra free time comparisons, drilldown to customer free times)
F	Analysis for demurrage; "If free time is not extended what will be the profit?"
R	Debited demurrage lists by port per week and/or month.
R	Listing of debit notes per month and comparison of debit dates and credit dates
F	Following system for leased containers to be delivered to owner, informing container numbers that have contracts ending 1 month later.

F	Following of re-export cargo
F	Warning system for getting export demurrage
F	Cost calculation program to estimate cost for transportation for the case of same shipper, same commodity and same commodity.
R	Investigation of full and empty traffic from port to port. Comparison of ports by imports and exports periodically
F	Movement list for containers when two same movements occur.
F	System must have vessel schedules and all loadings must be shown by lines
F	Evaluation of empty loading container costs (freight/loading/discharging charges) for vessel, port to port and line in a given period of time
F	System must separate EMES containers and hired containers when necessary in analysis.
R	Cost analysis based on container numbers.
F	System controls if agent used or not used repaired container after 5 days of repairing.
F	System supports the 3 dimensional "Push In" damage explanations.
F	Container positioning break even point analysis is provided by the system.
F	System provides detailed information about the overdue containers
F	By buying new containers system provides detailed information about all container series / actual EMES stock as recap or in list form.
F	It's possible to get data about the waiting time of the empty containers on the ports due to the vessel loading lists coming from the agents.
R	Data about the characteristic of the on-call ports can be retrieved from the system.
R	System provides the evaluation of the agent's performance (due to determined criterion) based on the reporting to EMES.
F	EMES's manual interference to the container movements is available.
R	Information about container stocks per ports in given time arrival is possible (as recap)
F	Actual information about owned and leased containers is provided.
F	Constraints about Lease/Prohibited containers can be seen by all agents

	through the system. (Agents are not allowed to change these constraints)
F	Agents can follow containers (empty/full) that are going to be discharged at related ports through the system.
F	Process outputs (mentioned in CMC Scenario) are provided by the system.
R	Reports about the “Free time” given to customers.
F	In “sublease” function, modification needed about adding more slabs for the rate periods .
R	Report showing the “Full/Empty Loading Costs”.
F	System alerts the user one month, before officially owning containers by lease purchase
	TRADE DEPARTMENT
F	System inputs (as mentioned in the Trade scenario) are available.
F	System contains the information about the requesting agent, shipper, cargo.
F	Special Rate Request can be seen in the system with all details. (Place of Receipt, POL, POD, Final Destination, Requested Freight, Surcharges, Validity duration, Shipment type.....)
F	User can get data about the former agreements from the system using the related reference codes.
F	System alerts the user if the agreement duration is invalid.(overdue agreements)
F	Online dialog between the agent and the EMES Trade is possible and dialog history can be kept.
F	Changes made in the existing data can be followed. (by whom and when)
F	By evaluating the SRR or Free Time Extension Request, system serves necessary information like the bookings, customer profile, vessel fullness, containers(for instance empty available at POL), min costs per container (according to the determined voyage)....
R	Statistical data about the actual amount of containers in depots is available in the system.
F	There’s an option in the system for Approval/Denial about the SRR /Free Time Extension Process.
F	By approval, system saves the agreement with a new reference code.

F	System crosschecks the Approved Special Rate with the rate applies in the manifest.
F	System supports the queries due to the customers, agreements and containers.
F	Process outputs (mentioned in Trade Scenario) are provided by the system.
F	System supports the quotes due to the agreements made with third party companies for point to point cases. (Truck, train)
	OPERATIONS DEPARTMENT
F	System inputs (as mentioned in the Operations Scenario) are available.
F	System contains detailed information about the vessel (velocity, capacity, empty slots, fuel level, and position) transit ports, booking lists, exact distance between the ports (to be called on).
F	System allows booking via internet.
F	System supports the “cut off process” according to agent booking information. (Prospect and real bookings)
F	System supplies an output to Plan Master Program to plan the vessel by booking information.
F	The daily actual positions of vessels are visible on the system for the agents
F	System contains “End of sea passage time” (EOSP) and “Commerce of sea passage time” (COSP) values in order to evaluate the performance of the vessel. (Duration and the fuel expenses between these passages)
F	By transferring, if the transfer is for EMES freights, when the equipments are discharged at the transit port, system automatically books to the nearest Vessel going destination.
F	By feedering, system checks if there’s a former regular agreement with the related ship-owner. (due to the customer code)
F	Former feedering agreements are kept in the system.
F	System supports the slot reservations.
F	System provides a messaging tool between agents and EMES Operation. (For the shiftings made and related costs)
F	System takes the weather changes into consideration
F	System allows updates in the schedule due to last changes (weather,

	barging...)
F	Process outputs (mentioned in Operations Scenario) are provided by the system.
R	Information about the fuel consumption and total operation time of vessels (per port) can be retrieved from the system.
	LINE MANAGEMENT
F	System inputs (as mentioned in the Line Management Scenario) are available.
F	Agreements with the partners are kept in the system with reference codes. (Share percentages, slot allocation within, freight rates) Retrieval to these agreements is any time possible.
F	When the operator is EMES, system serves detailed information about the freight and the costs (port expenses, agency commission, barging, insurance, hire cost...)
F	System supports the hire price changes and the probable port changes during the voyage.
F	System calculates the break even point for shipping empty containers by considering all costs and freight charges at given region, if a request comes from Agent about requirements for equipment.
F	Container based costs can be retrieved from the system.
F	When a request comes to visit an additional port, system calculates break even point of changing way. (By values of number of equipments to ship, freight charges, shipping and other costs for visit etc.)
F	System provides the PS (Profitability Statement) report as output.
F	Information about the slot agreements with other lines is available in system.
F	Information about the feeder agreements with other lines is available in system.
R	Feeder report for a determined line can be retrieved from the system. (monthly, annual reports)
F	Information about Vessel hiring/renting and related costs/income is available in the system.

F	System supports Profit/loss credit applications among the partners
F	Operator selection for shareholding lines: Comparison with operator company and our information for voyage.
F	System provides the information needed for Line Planning
	FOREIGN ACCOUNTS- DISBURSEMENT
F	System inputs (as mentioned in the Foreign Accounts Scenario) are available.
F	System serves the information automatically from “through rate list”, consisting of the predetermined charges.(Including the pre-carriage and on-carriage charges)
F	System supports territory and country constraints and laws then makes calculations according to country, port.
F	System delivers information if any required billing, that are not related with BLs (like a customs penalty), will be made to customer.
F	Checking the demurrage incomes\balance viewing
F	Comparison invoice coming from agents with the EMES system information.
F	Inputs for invoices for the hired/rented containers are available.
F	Total loss can be retrieved from the system.
F	Invoice verification is done automatically by the system.
F	The system validates all freight charges collected locally against the actual freight rates quoted in the customer profile database.
F	It's available to get invoices coming from third party companies (due to the agreements about on-carriage, pre-carriage by truck/train)
R	System supports queries due to all the variables in an invoice. (Customer, vessel, service code, amount, invoice date...)
F	If a same billing is twice or more times invoiced to EMES, system alerts EMES Disbursement Account.
R	Reporting about the invoices according to their status (paid, to be paid) for the given time interval is available.
F	Information about the actual Exchange Rate is available in the system and it can be updated.

F	System crosschecks the service codes and the related freight to these service codes.
F	System compares automatically the freight in the manifest and the one mentioned in the SRR.(Remarks due to the mismatches are available)
F	There's an authority in the system for EMES Disbursement Accounts to change/cancel the invoice.
R	Reports about the liner and feeder in details are available in the system.(Including the information about service codes, dates, vessel, shipper/consignee, feeder, line, voyage, payment type, currency, POL, POD, BL number, total amount to be invoiced...)
F	System supports costs due to different container types (IMO, reefer, out of gauge...).
F	Transformation of an invoice to the Turkish invoice is available in the system.
F	There's an approval/denial option in the system for EMES Disbursement Accounts about the costs coming from the agents.
F	Costs based on the Feeder Agreements should be calculated automatically according to the agreement items.(constraints due to quantity, frequency, routes, tonnages...)
F	System provides data retrieval about the invoices coming from a specific agent and to be invoiced to this agent in given time interval.(month/week...)
F	Reports about the third party company costs are available in the system.(according to the dates or location..)
F	By invoicing about transshipments, predetermined actual rate tariffs should be taken into consideration by the system.
F	Credit notes, freights per agent in a specific time can be followed in the system.(Balance status of the agent can be retrieved)
R	System provides reports about the approved D/As & cargo invoices coming from the agents and about freight /demurrage invoices, that are invoiced to the agents. (Transfer of these data to Statement of Accounts should be done in order to see the open accounts.)

APPENDIX H. MATLAB FILE FOR FUZZY EVALUATION

```

[System]
Name='tez4'
Type='mamdani'
Version=2.0
NumInputs=3
NumOutputs=1
NumRules=42
AndMethod='min'
OrMethod='max'
ImpMethod='min'
AggMethod='max'
DefuzzMethod='centroid'
[Input1]
Name='RFIScores'
Range=[0 6500]
NumMFs=3
MF1='Low':'trapmf',[-1830 -161 4800 5500]
MF2='Average':'trimf',[4800 5500 6200]
MF3='High':'trapmf',[5500 6200 7860 10200]
[Input2]
Name='DevelopmentTime'
Range=[0 500]
NumMFs=3
MF1='Medium':'trimf',[100.211416490486 200.211416490486 300.211416490486]
MF2='Short':'trapmf',[-529.317124735729 -133.317124735729
99.6828752642706 199.682875264271]
MF3='Long':'trapmf',[200.211416490486 300.211416490486 699.211416490486
1100.21141649049]
[Input3]
Name='PurchaseCost'
Range=[20 50]
NumMFs=3
MF1='Cheap':'trapmf',[13.5 20 25 32.5]
MF2='Normal':'trimf',[25 32.1300211416491 39.9]
MF3='Expensive':'trapmf',[32.5 40 51.2 60.8]

[Output1]
Name='Optimality'
Range=[0 100]
NumMFs=5
MF1='Poor':'trimf',[20 40 60]
MF2='Good':'trimf',[60 75 90]
MF3='VeryGood':'trimf',[40 60 75]
MF4='Bad':'trapmf',[-91 -11.1 20.1374207188161 40]
MF5='Excellent':'trapmf',[75 90 111.1 191.1]

[Rules]
3 2 -3, 5 (1) : 1
3 1 0, 5 (0.4) : 1
2 2 0, 3 (0.5) : 1
3 1 0, 2 (0.8) : 1
2 2 3, 2 (0.3) : 1
2 2 1, 5 (0.2) : 1
3 1 3, 2 (0.3) : 1

```

3 1 2, 2 (0.4) : 1
3 1 1, 2 (0.6) : 1
2 1 1, 2 (0.8) : 1
2 1 2, 2 (0.6) : 1
2 1 3, 1 (0.8) : 1
1 2 1, 3 (0.8) : 1
1 2 2, 2 (0.7) : 1
1 2 3, 1 (0.2) : 1
2 3 1, 2 (0.3) : 1
2 3 2, 1 (0.7) : 1
2 3 3, 4 (0.9) : 1
1 3 3, 4 (1) : 1
1 3 2, 4 (0.7) : 1
1 3 1, 4 (0.4) : 1
0 3 3, 4 (0.9) : 1
0 1 3, 1 (0.5) : 1
0 2 3, 2 (0.2) : 1
0 3 1, 2 (0.2) : 1
0 3 2, 1 (0.9) : 1
0 2 2, 2 (0.8) : 1
0 2 1, 3 (0.8) : 1
3 1 0, 3 (0.3) : 1
1 3 0, 4 (0.8) : 1
1 1 0, 1 (0.9) : 1
2 3 0, 4 (0.4) : 1
0 0 3, 1 (0.6) : 1
0 0 2, 2 (0.1) : 1
0 0 1, 3 (0.6) : 1
0 3 0, 4 (0.7) : 1
0 1 0, 2 (0.7) : 1
0 2 0, 5 (0.2) : 1
3 0 0, 5 (0.8) : 1
2 0 0, 2 (0.6) : 1
1 0 0, 1 (0.8) : 1
3 1 -2, 1 (0.8) : 1

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